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# **Information Environment and Gains from Corporate Takeovers**

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**Submitted for the Degree of Doctor of Philosophy in Finance**

**Durham Business School**

**University of Durham**

**August 2009**

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Yujun He

# **Information Environment and Gains from Corporate Takeovers**

By Yujun He

## **Abstract**

Motivated by the inadequate research in understanding the determinants of takeover wealth creation, as well as the theoretical and practical importance of information environment in the takeover market, this thesis examines the wealth effects of information environment on UK takeovers. It regards information dissemination as a process inherent in takeover announcements, along which, factors capturing the characteristics of information sender, information content, information recipient and market condition, are addressed to form three key research issues.

First considered are the wealth effects of misvaluation conditional on information signalled by payment and financing methods of takeovers. The results indicate that a price run-up via an upward revaluation follows undervalued bidders releasing good news (non-equity financed cash deals). Secondly, this research is concerned with the wealth effects of investor sentiment, towards the information released, at a whole market and individual firm level. The results show that high investor sentiment drives up target firms' announcement returns and further causes an increase in takeover premium. The last issue addressed is the relation between information asymmetry and gains to frequent bidders. The results suggest that information asymmetry declines in a merger series while serial non-equity financed cash deals generate decreasing bidders' announcement returns since the scale of their upward revaluations continually decreases with subsequent announcements. These three groups of results form a mechanism of information environment's wealth effect as follows. Takeover announcements release new information. With the arrival of new information investors update their assessments of firm value. The scale of revaluation is determined by a firm's information asymmetry, the direction of it depends on firm misvaluation, information signalled by takeover announcements and the investor sentiment in interpreting this information.

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*Yujun He*

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# **Chapter 1:**

## **Introduction**

## 1.1 Research Motives and Overarching Research Focus

With the intensified competition in the capital market, corporate organizations have put an increased focus on their value creations to ensure an advantage over competitors. Investing in value-enhancing projects and further realizing organic growth is a strategic plan that a firm may consider. However, with the advanced regulations in the market for corporate control and the developed technologies that facilitate capital flow, a growing number of companies have turned to an alternative approach; that of takeovers. Through takeovers, firms expect to create value by improving efficiency and productivity of the resultant unit after takeovers (Bradley *et al.*, 1983). Since the market for corporate control enables resources to move quickly to their highest-value use, takeovers should create benefits for the firms involved, along with the economy as a whole. However, counter-arguments suggest that the great majority of takeover deals fail to deliver these expected benefits; destroying rather than creating value. Furthermore, it can be argued that the corporate control market damages the morale and productivity of corporate organizations and gives rise to monopoly concerns (Jensen, 1988).<sup>1</sup>

Intrigued by the original takeover objective of value creation, and the controversy surrounding takeover outcomes, financial economists have engaged in accruing considerable knowledge of the takeover market. This research area forms a significant strand of corporate finance studies. The empirical evidence provided indicates that, in

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<sup>1</sup> For example, takeover and restructuring activities usually involve major organizational changes. This sometimes results in “contractions involving plant closings, layoffs of top-level and middle managers, staff and production workers, and reduced compensation...The value restructuring creates do not come from increased efficiency and productivity; instead, the gains comes from lower tax payments, broken contracts with managers, employees and others, and mistakes in valuation by inefficient capital market.” (Jensen, 1988, p.22).

general, takeovers generate substantial gains for the created combination; however such gains are not distributed evenly between both parties. Shareholders of bidding firms suffer from wealth loss, while target firms receive large wealth gains (e.g., Dodd, 1980; Franks *et al.*, 1991; Andrade *et al.*, 2001).

By extrapolating upon traditional theories (for example, economies of scale, economic disturbance theory and agency costs of free cash flow), extant literature has developed several schools of thought in theorizing and rationalizing the motives and value effects of takeovers. These include the efficiency theory (Bradley *et al.*, 1983), neoclassical theory (Gort, 1969; Harford, 2005), hubris theory (Roll, 1986), managerialism theory (Jensen, 1986) and the misvaluation theory (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004). Although these theories expose takeovers to the influences of different factors, such as operational efficiency, economic disturbance, hubris, managerialism motives and misvaluation, the building-blocks of these theories simultaneously highlight the role of information and its implications.<sup>2</sup> In particular, the market mechanism that underlies neoclassical theory, managerialism theory and misvaluation theory is one where information is not freely available and investors disagree on its implications. Therefore, a research focus concerned with information environment in the market for corporate control will reveal a better understanding of mergers and acquisitions.

In addition to the importance of information environment from a theoretical viewpoint as discussed above, the traits of information distribution in corporate

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<sup>2</sup> For a literature review specific to these theories, as well as discussion on their information related building-blocks, see section 2.2.

practice also stress the necessity of a research focused on the relevance of information environment to the takeover market. Companies involved in merger negotiations are obligated to disclose their activities to bidding and target firms' shareholders, the takeover panel and the public. The Takeover Panel Code, not only attempts to enforce the accuracy of information but also, works to ensure prompt information distribution.<sup>3</sup>

However, despite the Takeover Panel Code, information remains unevenly distributed between firms and outside investors due to the nature of information distribution in corporate practice. Two main points, highlighted by Myers and Majluf (1984), can account for the nature of information distribution. Firstly, although a firm is legally obliged to supply sufficient verifiable information to reveal its true condition, the costs in obtaining and verifying this information may be significant, and thus hinder investors' access to such information. Secondly, even if there are no costs incurred and no need to guard proprietary information, outside investors may still find themselves subject to an information disadvantage. This is because the organizational knowledge possessed by managers allows them to interpret the information and analyze potential impacts on the organization from an insider's perspective. Such organizational knowledge, as well as the interpretation based on this information, is unattainable for outside investors. This inevitable, uneven information distribution may result in potential gains, generated by an information advantage, to firms involved in the takeover market.

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<sup>3</sup> The Takeover Panel Code regulates the UK takeover market. It requires that "shareholders must be given sufficient information and advice to enable them to reach a properly informed decision as to the merits or demerits of an offer. Such information must be available to shareholders early enough to enable them to make a decision in good time"; and that "before the offer document is made public, a copy must be lodged with the Panel. Copies of all other documents and announcements bearing on an offer and of advertisements and any material released to the media (including any notes to editors) must at the time of release be lodged with the Panel and the advisers to all other parties to the offer and must not be released to the media under an embargo".

The importance of information environment in the corporate control market, in both a theoretical and a practical context, leads to growing economics of unevenly distributed information (information asymmetry). This notion underlies extensive work, for example, on agency cost (e.g., Jensen, 1986), adverse selection (e.g., Brown and Ryngaert, 1991) and revaluation via information dissemination (e.g., Draper and Paudyal, 2008).

The theoretical implications of information environment, particularly information asymmetry, on corporate takeovers primarily surround the payment mechanism of transactions. More specifically, the payment mechanism is regarded as an information carrier which determines the value effects of acquisitions (Myers and Majluf, 1984; Eckbo *et al.*, 1990). Acquiring firms may hold private information which is unknown to the market. The unevenly distributed information gives rise to the possibility that managers, who possess the private information that their firm's shares are overvalued, will in turn use these inflated shares to acquire a target firm. Investors then interpret the signals conveyed by this equity payment, and further evaluate the prospects of the acquirer based on their interpreted information. Once recognizing the adverse selection problem, they will consequently evaluate the acquiring firm downwardly. Therefore, negative announcement-period returns are generally associated with bidders making equity payments.<sup>4</sup>

The information asymmetry in these studies is un-quantified. A more recent study of Draper and Paudyal (2008) however, quantifies this asymmetry and provides some insight into its relevance to bidders' gains in the presence of misvaluation. If

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<sup>4</sup> This conjecture has been supported by abundant empirical findings. See for example, Frank *et al.* (1991), Andrade *et al.* (2001) and Bouwman *et al.* (2003).

bidders' gains could be deconstructed into synergies and revaluation gains, information asymmetry poses the potential to drive bidders' share prices through revaluations. More specifically, if a firm were previously undervalued and subject to severe asymmetric information, improvements in information dissemination through takeover announcements could draw the attention of the investment community and, accordingly, generate the opportunity of revaluating existing assets and growth opportunities. Therefore, compared with bidders surrounded by less severe information asymmetry, acquirers with greater asymmetric information expect larger absolute changes in stock returns via revaluation.

Nevertheless, despite the above focus on information asymmetry surrounding acquiring firms, and on methods of payment as an information carrier, these research attempts tend to be inadequate when examining the relationship between the value effects of corporate takeovers and the information environment. This is because neither the information asymmetry nor the information carrier can sufficiently capture all elements existing in a broad information environment.

This limited focus of extant studies, as well as the aforementioned importance of information environment from both theoretical and practical perspectives, gives an axis and direction in which this study is set. This thesis aims to extend takeovers to a broader, dynamic information environment by examining the effects of several information elements inherent in the information dissemination process of takeover announcements. The use of these information elements, including information (information content signalled by takeover announcements), information sender (information asymmetry surrounding acquiring firms and information uncertainty



regarding target firms), information recipient (investor sentiment involved in interpreting the information) and market condition (misvaluation), is intended to comprehensively represent this information dissemination process. In light of such an information dissemination process, this thesis examines the value effects of the information environment, and of the changes in this environment, on corporate takeovers. Further, it examines the mechanisms under which these value effects work.

The interactions to be examined, between information environment and takeovers, are hypothesized along the information dissemination process as follows. Information asymmetry surrounding an acquiring, or target firm, impedes investors from evaluating this firm's value and its growth opportunities; this can further give rise to a misvaluation of the firm concerned. Accordingly, a change in this evaluation, especially in the misvaluation, is expected with changes in the information environment surrounding the firm. Specifically, with the arrival of new information via takeover announcements, investors update their assessment of a firm's value. This revaluation process depends on both the contents of information sent out by the announcements and the investors' sentiment involved in interpreting this information. If investors can always rationally estimate stock returns, then expected returns conditional on bad news released would be negative for a stock subject to severe asymmetric information. Conversely, the expected return conditional on good news announced would be positive for such a stock. However, as suggested by behavioural finance literature, investors' reactions are not always rational and thus their predictions of stock performance are not necessarily correct, since behavioural factors are involved in their stock return estimations. Therefore, in the presence of information asymmetry, information contents and investor sentiment work

simultaneously in determining bidding or target firms' announcement returns. Figure 1.1 explicates this hypothesized value effects-determination process subject to the information environment. Key elements of it, including misvaluation, investor sentiment and information contents are addressed respectively in three empirical chapters.

## **1.2 Contributions and Issues**

This research contributes to corporate takeover literature in three aspects and further enables an understanding of the relationship between information environment and the wealth effects of takeovers. The paragraphs below contain a brief outline of the motivations, the objectives and the empirical evidence of the three empirical chapters upon which contributions to relevant literature are drawn.

Extant research on the relation between misvaluation and the takeover market tends to have a greater stock merger focus. Additionally, by assuming that in making cash payments no equity issue is involved, cash mergers are naturally associated with undervaluation, while equity deals correspond to overvaluation. For example, the Shleifer and Vishny (2003) model predicts that "overvaluation could be the motive for most stock acquisition, which increase the buyer's willingness-to-pay in stock mergers, though it has no effect in cash acquisition" (Friedman, 2004, p.1). Nevertheless, this assumption and the conclusion based on it are debatable, since the use of cash as a payment mechanism does not necessarily mean that the actual source of the cash payment comes purely from a firm's internal cash flow. Instead, external equity flow and debt flow serve as two financing alternatives (Schlingemann, 2004).

Therefore, after distinguishing the fundamental difference between payment methods and transaction financing, the necessity of re-examining the potential misvaluation effects on cash deals arises.

Motivated by these under-researched and mis-interpreted misvaluation effects on cash deals, Chapter 3 examines the potential influence of misvaluation, conditional on payment methods and transaction financing, by deconstructing it into market-, industry- and firm-level components while establishing an approximate relation between a transaction and its financing source (as in Schlingemann, 2004). The results show that a high frequency and announcement returns of cash deals can be seen during high market- and high industry- valuation periods. These effects are attributable to the hyped synergy-estimation bred by information asymmetry and high valuation. Since estimated synergies of the resultant unit, together with the revaluation effects of a takeover announcement, determine a bidder's announcement return, this hyped synergy-estimation thus has the potential to drive up a bidder's gain. Moreover, if an acquirer were previously undervalued, releasing good news to the market (i.e. announcing non-equity financed cash deals) would attract the attention of investors and further reveal the firm's true potential to investors. Consequently, an upward revaluation effect following the takeover announcement is likely to drive up the firm's short-run return. However, an acquirer's undervaluation does not give rise to this upward revaluation when bad news is released, i.e. when equity financed cash deals and share deals are announced.

These findings make three contributions to mergers and acquisitions literature in relation to market condition (misvaluation) and information content (a hybrid of

payment methods and transaction financing). Firstly, the findings clarify the fundamental difference between ‘methods of payment’ and ‘transaction financing’, which are assumed to be the same in the majority of existing literature. Further, it suggests that the documented positive value effects of cash payment (e.g., Franks *et al.*, 1991; Andrade *et al.*, 2001; Bouwman *et al.*, 2003) may not be generalizable due to different signaling implications of the financing sources of cash payment. Secondly, the findings suggest that cash deals are affected by overvaluation, which was previously not thought to be the case. This thus corrects the previously mis-interpreted misvaluation effects on cash deals, which assume there is no equity involved in cash payment and thus associate undervaluation with cash deals (as in Shleifer and Vishny, 2003). Thirdly, the different components (firm-, industry- and market-level components) of misvaluation are recognized, and thus a wider-ranging understanding of their effects in the corporate control market is provided. This understanding furthers the existing knowledge on the relevance of misvaluation to corporate takeovers. This misvaluation was previously examined in isolation by most existing literature, at either a market level or firm level, rather than being considered as a three-tiered system (for market valuation, see Tebourbi (2005) and Bouwman (2006) for example; for firm misvaluation, see Dong *et al.* (2006) and Ang and Cheng (2006) for example).<sup>5</sup>

Following on from this conclusion, concerning stock market reacting to takeover announcements, the valuation effects of other factors contained within these reactions also require addressing. In particular, there are potential effects the recipients of information may have on the manner and outcomes of information processing.

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<sup>5</sup> Most existing literature examines misvaluation in isolation with the exceptions being Bouwman *et al.* (2006) and Rhodes-Kropf *et al.* (2005). Rhodes-Kropf *et al.* (2005) deconstructed misvaluation into firm specific error, time series sector error and long-run value to book.

Therefore, market reactions to the arrival of new information via takeover announcements should not only incorporate the message itself (as examined in Chapter 3), but also include the effects of investors' behaviour and their sentiment reactions towards the information released.

Although it has been recognized that sentiment may drive asset prices away from their intrinsic values (e.g., Shiller, 1981; Fama and French 1988; De long *et al.*, 1991), only a few researchers have directly or indirectly applied this link between investor sentiment and asset valuation in the context of mergers and acquisitions (e.g., Rosen, 2006; Zhu *et al.*, 2008). The role of sentiment, in these attempts, is either un-quantified (e.g., Rosen, 2006), or confined to an aggregate market level (e.g., Zhu *et al.*, 2008). This market level research implies that sentiment-laden investors' reactions to one stock (or company) can be equally applied to another stock (or company). However, counter-views, like those held by Qiu and Welch (2006) and Baker and Wurgler (2006 & 2007), suggest that sentiment may have cross-sectional differences. Mergers and acquisitions, as individual corporate activities, are more likely to be exposed to these firm-specific, rather than market-aggregate, sentiment factors.

Motivated by the un-quantified role of investor sentiment in existing literature and the restricted research focus on sentiment at an aggregate market level, Chapter 4 addresses the sensitivities of both announcement returns and takeover premiums to sentiment at an individual firm, and aggregate market, level. This, to the best of the author's knowledge, has not previously been fully considered. The market level sentiment is measured by an indicator which is the first principal component of a

number of factors hypothesized to represent investor sentiment. This aggregate market sentiment, as shown by the results, influences target firms' announcement returns in the same direction as this sentiment, which further drives takeover premiums. However, contrary to the documented cross-sectional differences in the effects of sentiment on individual stock returns (Baker and Wurgler, 2006 & 2007), neither the announcement returns nor the premiums of speculative targets are more vulnerable to shifts in investor sentiment.<sup>6</sup>

These findings suggest three contributions to mergers and acquisitions literature in relation to information recipient (investor sentiment). Firstly, developed on the widely acknowledged Baker and Wurgler (2007) sentiment index, a similar indicator is made available for the UK market, which can be used to explore new research areas around UK investor sentiment. Secondly, the results improve the understanding of the role of investor sentiment in the market for corporate control by extending the relation between sentiment and takeovers to allow for individual differences. Thirdly, the results contribute to the ongoing debate concerning managerialism<sup>7</sup> in takeover overpayments by updating the knowledge about premium determination with investor sentiment. Accordingly, it suggests that the takeover premium determination process is not flooded with managerialism motives; instead, investor sentiment enters into this process and influences managerial decisions.

In the first two empirical chapters (Chapters 3 and 4), takeover deals are regarded as a static information dissemination process which corrects existing information

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<sup>6</sup> For an extensive explanation of the inconsistency between this work and existing literature, see chapter 5.

<sup>7</sup> Managerialism refers to managers of a firm being concerned with their own interests, above those of their shareholders, when making takeover decisions. For literature review specific on this issue, see section 2.2.3.

asymmetry surrounding takeover firms. This static process can be extended into a dynamic one, where serial takeover announcements are treated as a process of decreasing information dissemination. It is referred to as a decreasing information dissemination process, because, as more information becomes readily available to the market, less information remains to be released with subsequent acquisitions.

Although research efforts have been made towards serial acquisitions, few of them can adequately provide a thorough understanding of frequent acquirers' gains. For instance, managerial hubris hypothesis (Malmendier and Tate, 2004) and indigestion hypothesis (Conn *et al.*, 2004) cannot explain the long-run outperformance of frequent bidders, as they predict the opposite outcome. Similarly, capitalization hypothesis suggests that no significant returns should be observed in subsequent acquisitions and, in doing so, fails to rationalize why frequent bidders' announcement returns remain positive to the fourth bid (Ismail, 2008). Given that the great majority of takeover deals are announced by frequent bidders, the inadequacy of these existing theories highlights the research need of applying a theory which sufficiently rationalizes the performance of frequent bidders and provides a more coherent description of the value effects of serial acquisitions.

Moeller *et al.* (2006) point out that for a given distribution of returns, the expected returns conditional on good news increase as asymmetric information increases, while those conditional on bad news decrease as asymmetric information increases. These changes in information asymmetry can be explicitly quantified in a serial acquisition framework. Accordingly, developed upon the research of Moeller *et al.* (2006), Chapter 5 fills the aforementioned literature gap existing in serial

acquisitions by examining the relevance of dynamic information asymmetry to frequent bidders' gains. The results show that information asymmetry surrounding a frequent bidder, in general, decreases with subsequent bids. This implies that a greater value correction surrounds the announcement of the initial bid than those of following bids. Consequently, due to the decreasing scale of revaluations, inherent in serial acquisitions, serial non-equity financed cash deals, in general, generate declining announcement returns since the scale of their upward revaluations continually decrease with subsequent announcements. However, the non-upward revaluations of share deals and equity financed cash deals do not lead to declining returns of frequent bidders.

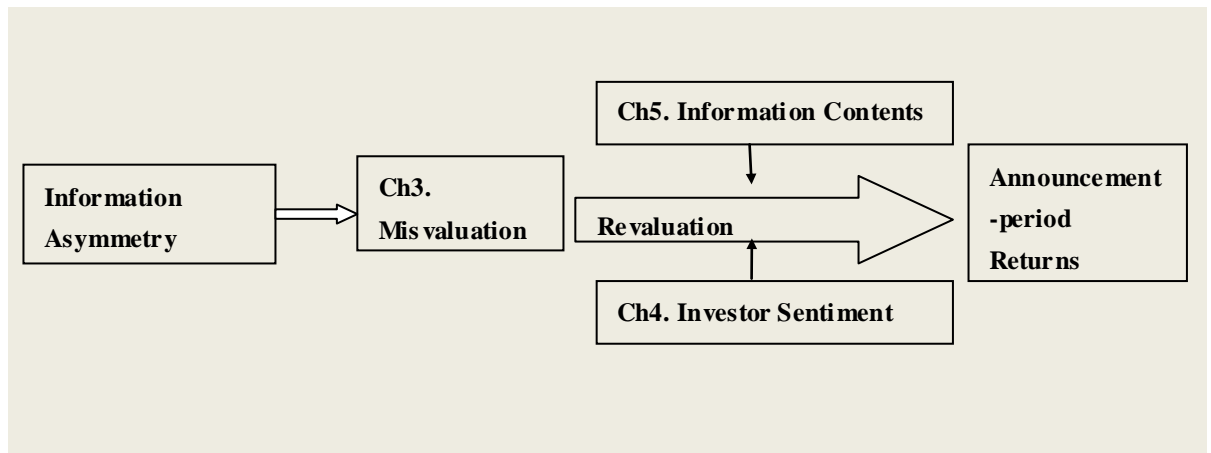
These findings hold two contributions to mergers and acquisitions literature in relation to information sender (information asymmetry surrounding acquiring firms). Firstly, they further the theoretical implications of the information asymmetry hypothesis on corporate takeovers by introducing a relation between takeovers and a dynamic information asymmetry. This relation goes beyond the current setting of takeovers and static information asymmetry. Secondly, they add to the knowledge of the rationale underlying frequent bidders' performance by comparing the empirical results against several predictions suggested by other theories and hypotheses. These comparisons reveal the deficiencies of existing theories in providing a coherent description of the value effects of serial acquisitions. It further highlights the significant role that asymmetric information plays in rationalizing the performance of frequent bidders.

To summarize, the findings of these three empirical chapters, together with the



related theoretical rationale, implicate several information-related factors inherent in the information dissemination process of takeover announcements. The value effects of these factors, as well as the mechanisms under which these value effects work, expand the limited focus offered by existing research, which examines the relationship between corporate takeovers and the information environment, into a broad and dynamic context. These factors will be addressed in chapters 3, 4 and 5.

**Figure 1.1 Structure of Thesis and Hypothesized Relations between Information Environment and Takeovers**



## **Chapter 2:**

## **Literature Review**

## 2.1 Introduction

Intrigued by the value creation objective of takeovers and the controversies surrounding takeover outcomes, financial economists have engaged in accumulating considerable knowledge concerning the occurrences and the value effects of corporate takeovers. Among these research efforts, the building-blocks of some traditional and fundamental theories have simultaneously highlighted the role of information environment and its implications. Given the importance of information environment in a theoretical framework, growing economics of unevenly distributed information underlies extensive recent work.

The theoretical implications of information environment, particularly information asymmetry, on corporate takeovers primarily surround the payment methods of transactions. More specifically, the payment mechanism is regarded as an information carrier which determines the value effects of acquisitions (e.g., Myers and Majluf, 1984; Eckbo *et al.*, 1990). Nevertheless, this focus, on methods of payment as an information carrier, tends to be inadequate in providing a comprehensive description of the mechanism under which the value effects of information work. Announcing takeovers contains a process of disseminating firm information which involves the interaction of several factors, including information sender, information content and information recipient. These factors and their interactions cannot be captured by an information carrier alone. Therefore, here arises the necessity of extending takeovers to a broader, dynamic information environment and further examining the relevance of several information elements within this environment to the occurrence and value effects of takeovers. Existing literature that has identified a series of factors shaping

takeover activities is reviewed in this chapter. Their relation to this research context is then discussed.

This chapter begins by reviewing fundamental theories which rationalize the occurrence of mergers and acquisitions. Meanwhile, the relation between the mechanics, of these theories, and the information environment is then highlighted in order to show information environment as an indispensable element in a thorough understanding of the takeover market. Having provided an overview of the rationale underlying the occurrence of mergers and acquisitions, this chapter then presents a review of the documented value effects of mergers and acquisitions by synthesizing the measurements and the suggested determinants of these value effects. At the same time, information environment, in relation to these determinants, is addressed so as to propose that a research on the relevance of information environment to both acquiring and acquired firms' announcement returns can further the knowledge on the value effects of corporate takeovers.

## **2.2 Information Environment and Theories on the Occurrence of Corporate Takeovers**

### **2.2.1 The Efficiency Theory**

A major group of hypothesized takeover motives are based on the efficiency theory, which regards improvements in a combined firm's operation as the determinant of takeover activities. These improvements are brought about by economies of scale, combinations of complementary resources and risk-spreading

opportunities (Bradley *et al.*, 1983 & 1988). Specifically, these three benefits can generate cost-reducing synergies for resultant units in the following ways.

Firstly, when economies of scale in production exists, a horizontal merger can be the source of cost reductions for firms of less than minimum efficient size. Secondly, when a production process requires closely integrated steps in the production chain, a vertical integration can reduce production costs by reducing the uncertainties involved in successive stages of the production. Thirdly, a reduction in costs can also be achieved, irrelevant of the form of the organization structure a firm takes. More specifically, size and diversification via takeovers can reduce risks, increase the capability of raising capital in the financial market and thereby bring about a reduction in costs (Mueller, 1980).

In addition to the cost-reducing synergies, the efficiency created by the combined entity also exists at a managerial level. Manne (1965) and Alchian and Demsetz (1972) suggest that the takeover market can facilitate competition among management teams for the right to control corporate assets. If the executives of a firm are responsible for that firm's poor performance, another management team can remove the existing one through a takeover. Hence, an improvement in the performance of the acquired firm is expected (Weston *et al.*, 2004).

This operational efficiency is ensured by the following stock market selection process, suggested by Fairburn and Kay (1989). A low stock price reflects a firm's poor performance caused by inefficiency. This opportunity is taken by potential raiders. Their improved management of the acquired firm's assets is then reflected in

the stock market, which in turn generates capital gains. The assumption underlying this stock market selection process is that the share price should reflect the relative expected profitability of a firm. It is only when the market pricing mechanism can incorporate this firm performance related information, and can further respond to changes in this information, such a stock market selection process, and thus mergers and acquisitions, will take place.

### **2.2.2 The Neoclassical Theory**

Even without the intention to improve operational efficiency, takeovers, as suggested by the neoclassical theory, can still occur as a consequence of economic shocks (e.g., Gort, 1969; Mitchell and Mulherin, 1996; Harford, 2005). Specifically, neoclassical theory suggests that economic disturbances, as well as technological and regulatory shocks, lead to industry reorganizations. In this reorganization process, industry assets are reallocated through mergers and acquisitions. Such asset reallocation follows the mechanism of Gort's (1969) economic disturbance theory.

Information asymmetry, different evaluations of information and different behaviors acting upon information released are three of the assumptions underlying this economic disturbance theory of takeovers (Gort, 1969). More specifically, if a firm's present and potential shareholders have homogenous expectations about the firm's future, any change in expectations, given by economic disturbances, will result in an immediate change in the firm's share price and further lead to a similar adjustment of intentions towards portfolio holdings of the firm's stock. Therefore, these homogenous expectations, and hence the absence of exchanging portfolio

holdings between present and potential shareholders, can rule out the opportunity of mergers and acquisitions. If, on the other hand, a firm's present and potential shareholders have different expectations about the firm's future, takeovers can take place in the disturbance of the firm's share price via exchanging portfolio holdings between these two groups of shareholders. Their different expectations arise from them having differing access to information or evaluating the hold information differently.

In light of the Gort's (1969) economic disturbance theory, Mueller (1980) explicates the occurrence of mergers and acquisitions in the presence of economic disturbances. Economic disturbances bring about a dramatic increase in a firm's share price, which cause the firm's potential shareholders to immediately update their expectations. If their expected share value is not only above the present market price, but also above the share price that will have to be offered to present shareholders, a change in corporate control will be accomplished.

Neoclassical theory has related fundamental shocks to takeover activities at an industry-level. It has successfully explained the movements of the US takeover market in the 1980s within its respective economic climate (Jensen, 1988). However, counterviews suggest that shocks, whether economic, technological or regulatory, should have different directional implications across stocks within an industry (Harford, 2005). Thus, the neoclassical theory fails to unite these fundamental shocks to takeover activities at a firm-specific level.



### 2.2.3 The Managerialism and Hubris Theories

The firm-specific focus of the managerialism and hubris theories, fills the area left unaccounted for by the neoclassical theory. It relaxes the assumption of rational management which underlies both efficiency and neoclassical theories. It further suggests managerial motivations as the driving force of merger and acquisition activities (e.g., Roll, 1986; Morck *et al.*, 1990; Jensen, 2005; Song, 2007).<sup>8</sup>

Hubris Hypothesis (Roll, 1986) forms the foundation of this strand of research. Roll (1986) suggests a takeover model, based on managerial hubris, where individual managers are prone to excessive self-confidence. For example, in explaining why managers would like to pay a premium for a firm which has already been correctly valued by the market, he suggests that the pure economic gains available to acquiring firms are not the sole, or even the primary, motivation in acquisitions. Instead, personal factors (for example, managerial overconfidence as in the study of Malmendier and Tate (2008)), drive managers to acquire firms. However, this does not necessarily imply that managers aim to maximize their private benefits and consciously act against their shareholders' interests. These managerial decisions may not be intended to sacrifice the interests of shareholders, although the results of these actions may not always be beneficial for shareholders.

Nevertheless, as suggested by the managerialism theory, there are some cases where managers consciously seek personal interest-maximization at the cost of their

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<sup>8</sup> Managerialism motives and managerial hubris are regarded as primary factors in explaining takeover premium, in particular the overpayments to target firms (e.g., Hayward and Hambrick, 1997). Takeover premium forms the research focus of chapter 4, where the empirical findings are compared against the predictions of these factors as well as investor sentiment.

shareholders (e.g., Seyhun, 1990; Berkovitch and Narayan, 1993). As managers and shareholders have different access to information, the information asymmetry between them can result in a principal-agent conflict.<sup>9</sup> This conflict can be magnified by high free cash flow in a firm (Jensen, 1986 & 2005). When internal funds are in excess of the investments required to fund positive net present value projects, managers may engage in value reducing takeovers. Developed upon these agency costs of free cash flow, Shleifer and Vishny (1989) introduce a managerial entrenchment model. According to this model, managers are hesitant to pay out cash to shareholders; instead, they make investments, such as acquisitions, which increase the likelihood of receiving a high payment and reduce the chance that they will be replaced.

#### **2.2.4 The Misvaluation Theory**

The magnitude of these managerialism motives does not remain constant. Instead, as suggested by the agency costs of overvalued equity (Jensen, 2005), it varies with changes in misvaluation. Managers, from a firm with substantially overvalued equities, have the ability to correct any overvaluation; yet this will consequently disappoint the optimistic market expectation. Therefore, they are prone to meet this market expectation by creating a high growth illusion. This is achieved by engaging in value destroying acquisitions. This managerialism incentive, magnified by overvaluation, suggests that misvaluation could be an indispensable driving force in the takeover market.<sup>10</sup>

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<sup>9</sup> The principal-agent conflict refers to the conflicts between a firm's managers (agent) and its shareholders (principle) over the choice of the company strategy. This conflict can give rise to agency costs. Such costs are incurred in the process of monitoring managerial behaviour and from efficiency losses.

<sup>10</sup> Misvaluation forms the research focus of Chapter 3, where effects of misvaluation on the intensity and the value effects of takeovers are examined. For an intensive discussion specific to misvaluation

Misvaluation theory explicitly examines the relevance of misvaluation to the occurrence of mergers and acquisitions (e.g., Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Ang and Cheng, 2006; Rosen, 2006). The misvaluation hypothesis predicts that overvalued firms will use their overpriced equity to acquire undervalued targets. Rhodes-Kropf and Viswanathan (2004) provide supporting evidence for this hypothesis. They claim that, in general, overvalued firms win takeover battles and undervalued targets are purchased. Moreover, companies from overvalued sectors purchase firms which are in relatively undervalued sectors. The valuation difference between acquiring firms and their targets is roughly 20% of the targets' market to book ratio.

Various motives underlie this driving force of misvaluation in the takeover market. Both the use of overpriced stocks as cheap currency (Shleifer and Vishny, 2003) and the agency costs of overvalued equity (Jensen, 2005) can prompt acquirers' involvements in takeovers. Targets, on the other hand, are likely to accept the overvalued offers due to their synergy-estimation errors, which can be intensified by high market-valuation (Rhodes-Kropf and Viswanathan, 2004), or the relatively short managerial time-horizons exhibited by their managers (Shleifer and Vishny, 2003). These motives from both a bidder's and a target's perspective suggest an active takeover market in the presence of overvaluation.

In summary, by extrapolating upon traditional theories, extant literature has developed several schools of thought in theorizing and rationalizing the occurrence of mergers and acquisitions, including the efficiency theory, neoclassical theory,

managerialism theory, hubris theory and the misvaluation theory. Although these theories expose takeovers to the influence of different factors such as, operational efficiency, economic disturbance, hubris, managerialism motives and misvaluation, the building-blocks of these theories simultaneously highlight the role of information and its implications. In particular, the market mechanism underlying neoclassical theory, managerialism theory and misvaluation theory is one where information is not freely available and investors disagree on its implications. Therefore, a research focused on information environment in the market for corporate control will reveal a better understanding of mergers and acquisitions.

The information environment addressed in this thesis concerns four aspects. These aspects are information (information content signalled by takeover announcements), information sender (information asymmetry surrounding acquiring firms and information uncertainty regarding target firms), information recipient (investor sentiment involved in interpreting the information) and market condition (misvaluation). The use of these four information elements is intended to comprehensively represent the information dissemination process inherent in takeover announcements. Literature relating to these factors is reviewed in each empirical chapter.

### **2.3 Gains from Corporate Takeovers**

Having reviewed the causes of corporate takeovers, the related consequences are summarized in this subsection. The rationale underlying the occurrence of takeovers can further shed light on the value creation of this corporate activity. In general, the

empirical evidence provided indicates that takeovers generate substantial gains for the created combination, yet such gains are not distributed evenly between both parties. Shareholders of the bidding firms suffer from wealth loss, while target firms receive large wealth gains (e.g., Dodd, 1980 and Franks *et al.*, 1991; Andrade *et al.*, 2001). Determinants of these value effects are suggested in light of the rationale underlying the occurrence of takeovers. In order to provide a comprehensive review on this issue, measurements of these value effects and factors influencing these value effects are outlined in the paragraphs below.

### **2.3.1 Measuring Gains from Corporate Takeovers**

Gains from corporate takeovers can be presented in different forms, for example reduced operational costs, improved profitability or wealth created to shareholders. Since shareholders are the residual owners of the combined entities, evaluating shareholders' wealth effects forms the primary approach of measuring takeover gains among existing research (Martynova and Renneboog, 2008).

In assessing these wealth effects, event study is the methodology primarily employed in mergers and acquisitions literature. Based on the proposition that, around a takeover announcement period, investors' assessments of the present value of a takeover's benefits can be immediately reflected by the firm's share price, a short-run approach of measuring takeover gains is developed (e.g., Dodd, 1980; Eckbo, 1983). This stock market reaction is measured over a short event period surrounding the initial public announcement of a deal. To quantify such market reaction, abnormal returns are used. These are the actual returns in excess of a benchmark return. This

benchmark return is what shareholders would expect to receive if the takeover event had not taken place. Firms' abnormal stock returns during a three- or five-day event window surrounding their takeover announcements are the most commonly used approach in measuring short-run gains from corporate takeovers. For example, a three-day event window has been used in the studies of Moeller *et al.* (2004 & 2005) and Bouwman *et al.* (2006); a five-day event window has been used in the research of Walker (2000), Fuller *et al.* (2002), Bradley and Sundaram (2004) and Faccio *et al.* (2006).

As mentioned above, this short-run measurement assumes stock market efficiency (Datta *et al.*, 1992). However, counter-arguments suggest that markets require time to evaluate the implications of takeovers (Martynova and Renneboog, 2008). Moreover, information about the progress of the takeover, and the integration of two firms, is gradually incorporated into the market expectation. Therefore, the value effects should be measured over a long-run post-acquisition period. Accordingly, acquiring firms' abnormal returns have been measured over a long-run event window, which ranges from 24 months to 70 months, based on several benchmark return models. For instance, using a size and beta adjusted model, Agrawal *et al.* (1992) examine US bidders' cumulative abnormal returns over a 60-month window after their announcements. A 24-month event window is used by Gregory (1977), who measures UK bidders' abnormal returns based on both CAPM and Fama-French three-factor model. An average two-year post-announcement return of -10.99% is reported by Bradley and Sundaram (2004), which is obtained by applying the market-adjusted model.

After discussing and comparing the developed approaches in measuring takeover gains, one measurement is selected for this thesis based on the discussed research focus. Specifically, takeover activities contain a process of disseminating firm information. The relevance of factors along this process to the gains from corporate takeovers, constitutes the research objective of this study. Given this research focus, the stock market's reactions to a transaction should be measured along this information disseminating process. Therefore, a short-run approach is used in this study which can precisely examine the stock price sensitivity to these information related factors.

Having reviewed the developed approaches of measuring gains from corporate takeovers, and having further related them to the research needs of this thesis, factors influencing these gains are then discussed in the following subsections. Since this thesis examines the stock market reaction, from both a bidder's and target's perspective, to a takeover announcement along its information disseminating process, existing literature in relation to bidders' and targets' announcement returns is then reviewed in 2.3.2 and 2.3.3 respectively.

### **2.3.2 Bidders' Gains from Corporate Takeovers**

Bidders' gains from takeovers have been extensively researched by financial scholars, and a considerable divergence in bidders' announcement returns has been documented. For the US takeover market, Eckbo (1983) finds that, during the period of 1963 to 1978, the average return to shareholders of acquiring firms is

insignificantly different from zero (0.07%). On the other hand, Frank *et al.* (1991) and Graham *et al.* (2002) report significantly negative returns of -1.02% (covering the period 1975-1984) and -0.78% (covering the period 1980-1995) respectively. For the UK takeover market, Sudarsanam *et al.* (1996) find a significant return of -4.04% generated by acquirers over the period 1980-1990. Conversely, using a sample of 830 deals announced during the 1975-1990 period, an insignificantly positive return of 0.43% is reported by Higson and Elliott (1998). This empirical evidence suggests that, in general, returns to shareholders of acquiring firms are either insignificantly different from zero or significantly negative.

Despite this unsuccessful value creation for shareholders of acquiring firms in general, empirical findings in existing literature also reveal that, when the sample is partitioned into different subsamples according to several deal characteristics, some bidders can actually capture significant benefits from takeovers. Therefore, several deal and firm characteristics are suggested to account for bidders' announcement returns. Primary among these are methods of payment and target status.

In making an offer, public listed bidders can pay target firms with different methods, for example cash, stock or a combination of the two. The actual mode of payment is chosen through negotiations between the two parties, as it has some bearing on their shareholders' wealth. There is a largely unanimous agreement in literature that, from a bidder's perspective, equity acquisitions are associated with



significantly negative abnormal returns which substantially underperform cash bids.<sup>11</sup> For instance, Frank *et al.* (1991), using a sample of 156 cash deals, 128 equity deals and 114 mixed deals announced between 1975 and 1984, provide evidence that cash deals generate an average return of 0.83% which is 3.98% higher than share deals' announcement returns. This negative return, and further the underperformance, are consistent with the findings in the later research of Andrade *et al.* (2001) and Bouwman *et al.* (2003).

Signaling implications in the presence of information asymmetry are suggested as the primary factor underlying the stock performances of cash and equity bidders (Myers and Majluf, 1984). Acquiring firms may have private information which is unknown to the market. The unevenly distributed information gives rise to the possibility that managers, who possess the private information that their firm's shares are overvalued, will use these inflated shares to acquire a target firm. Investors then interpret the signals conveyed by this equity payment, and further evaluate the prospects of the acquirer, based on their interpreted information. After recognizing the adverse selection problem, they will consequently evaluate the acquiring firm downwardly. Therefore, negative returns are associated with bidders making equity payments.

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<sup>11</sup> Equity acquisitions are not always associated with significantly negative abnormal returns. For example, in the study of Moeller *et al.* (2004), the average return generated by 2958 equity deals is significantly positive (0.15%). However, the underperformance of share deals, compared with cash deals, is persistent, as this positive return is still 1.23% lower than cash bidders' gains.

In addition to payment methods, a large number of studies report that bidders' gains also depend on the status of target firms (i.e. private or public firms), with acquisitions of private targets generating substantially higher returns to the acquiring firms. Fuller *et al.* (2002) examine bidders' announcement returns of 456 public target acquisitions and 2060 private target acquisitions during the period of 1990 to 2000. They find that acquiring a private (public) target generates an average return of 2.08% (-1%) for bidding firms. This outperformance of private target acquisitions is also reported by Moeller *et al.* (2004). They show that US bidders, on average, earn positive announcement returns (1.49%) in acquiring private targets and negative announcement returns (-1.02%) in acquiring public targets. Similar results are documented by the UK takeover market based studies of Conn *et al.* (2005), Draper and Paudyal (2006) and the European takeover market based study of Faccio *et al.* (2006).

Having found that the relevance of target status to bidders' gains is widespread and persistent, several explanations are then offered, for example shareholder overlapping and market liquidity. Hansen and Lott (1996) posit that shares of a listed target can be part of the diversified portfolios owned by shareholders of the acquiring company. They are less inclined to monitor whether the listed target is overpaid, because the overpayment will eventually be recaptured through ownership of the target's shares. This overpayment lowers bidders' gains from acquiring a public target. Besides shareholder overlapping, the market liquidity of public targets' shares can

also give rise to overpayment and further reduce bidders' gains. Information surrounding public firms is more widely available and hence potential bidders may compete for the control of these firms. This increased possibility of competitive bids can give rise to an overpayment by bidding firms (Conn *et al.*, 2005; Draper and Paudyal, 2006).

In addition to the influence of payment methods and target status on bidders' gains, discussed in isolation from each other, a growing amount of research has examined the value effects of payment methods conditional on target status. For example, Faccio *et al.* (2006) examine European bidders' announcement returns (over a 5-day event window) from acquiring 735 public targets and 3694 privately held firms during the period 1996-2001. According to their empirical findings, cash deals generate positive returns to acquiring firms, regardless of target status. On the other hand, where share bids are concerned, announcement returns to bidders for public targets are significantly negative (-1.81%). Bidders for private targets capture, on average, a significant return of 3.90%. Similar results are documented by Chang (1998) and Bradley and Sundaram (2004) concerning a sample of US mergers and acquisitions.<sup>12</sup>

These findings show that value implications of payment methods, in particular share deals, are likely to differ across acquisitions for public and private targets. The

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<sup>12</sup> For example, Chang (1998) report an insignificant average return of -0.02% for public-cash deals, an insignificant average return of 0.09% for private-cash deals, a significant average return of -2.46% for public-stock offers and a significant return of 2.64% for private-stock offers.

differing value implications are then rationalized with the information asymmetry hypothesis and monitoring hypothesis.

The ownership of privately held firms is often concentrated within a small group. Target firms with such concentrated ownership have a strong incentive to examine acquiring firms and the bids they offer (Draper and Paudyal, 2006). Therefore, their acceptance of a share deal is a decision made after discreet consideration and suggests that they expect the deal to create value or at least that the bidder's share is not overvalued. This information, when conveyed to the market, is favorable for the acquiring firm. Therefore, bidders for private targets paying with shares should capture positive announcement returns.

The concentrated ownership of private targets can not only reduce the information asymmetry surrounding the acquiring firms but can also create blockholders. If a bidder for a private target uses equity payment in the transaction, a substantial portion of the combined firm's shares will be attributed to a small group of shareholders who are the prior owners of the target firm. This creation of outside blockholders can serve as an efficient monitor of managerial performance and can further reduce agency costs. Thus, it will result in an increase in firm value (Chang, 1998). Given this monitoring effect, bidders for private targets paying with shares should capture positive announcement returns.

In addition to the primary effects of payment methods and target status on acquiring firms' announcement returns, other firm or deal characteristics have also been identified as factors which can explain the difference in short-run gains to acquiring firms, for example target domicile, bidders' size and relative size. Literature in relation to these factors is reviewed in the paragraphs below.

Firstly, bidders' gains from cross-border acquisitions are expected to be higher than those from domestic acquisitions, if acquirers can capture the diversification benefits associated with cross-border acquisitions (Baldwin and Caves, 1991). However, inconsistencies exist between literature. For instance, in the study of Conne *et al.* (2005), cross-border acquisitions result in lower announcement returns than domestic acquisitions. This underperformance of cross-border acquisitions can be attributed to the imperfect information in valuing overseas targets and the difficulties in post-merger integrations on an international scale.

Secondly, a large firm size generally causes negative effects on bidders' announcement returns, irrespective of other deal characteristics (Higson and Elliott, 1998). In the study of Moeller *et al.* (2004), small acquirers in the US takeover market outperform large bidders by at least 2% in terms of abnormal returns. In addition, shareholders' wealth loss is more pertinent for acquisitions announced by large firms. Since large firms usually enter deals that require a high premium and generate negative synergies, overpayment has been suggested as the factor underlying the

underperformance of such firms (Loderer and Martin, 1990; Moeller *et al.*, 2004). The cause of this overpayment is related to managerial hubris. More specifically, according to hubris hypothesis, managerial decisions are driven by managers' personal factors, for example self-confidence. Managers of large acquiring firms are likely to be exposed to such hubris due to the size and the prestige of the firm they manage (Demsetz and Lehn, 1985). Their accumulated managerial confidence will lead to overpaying for target firms, and thus give rise to lower abnormal returns for acquirers.

Thirdly, the relative size of target to bidder is another determinant of bidders' gains. Generally, a larger relative size leads to greater takeover gains to acquiring firms (e.g., Asquith *et al.*, 1983; Kang, 1993). Chatterjee (1986) attribute this positive relation to financial synergies. These synergies generated by mergers, which are represented by the reduced costs of capital captured by the combined units, are limited by the targets' size. In general, the larger the relative size, the greater the financial synergy that can be achieved, and in turn the more the bidders' gains.

To summarise, the above review of theoretical and empirical research on mergers and acquisitions suggests several factors which affect or determine short-run gains to acquiring firms. Primary among these are methods of payment and target status. It is important to note that, in rationalizing the value effects of these two factors, information environment (in particular information asymmetry) has offered substantial

explanatory value. This suggests the necessity of explicitly examining the relation between information environment and bidders' gains from takeovers. Such a relation forms the main research focus of this thesis. Moreover, in uncovering whether this relation exists, the identified series of characteristics that account for bidders' announcement-period returns (as mentioned in the paragraphs above) are included as control variables.

### **2.3.3 Targets' Gains from Corporate Takeovers**

The contrast between the takeover returns to target firms and those to bidding firms is striking. More specifically, as discussed above, returns to shareholders of acquiring firms are, in general, either insignificantly different from zero or significantly negative. Conversely, share prices of target firms significantly increase around takeover announcement periods. For example, Asquith *et al.* (1983), concerning a US sample covering the period of 1962-1976, measure targets' returns over a 20-day window prior to the announcement date and report an average return of 16.8%. A 16.8% abnormal return to target firms is also found by Malatesta (1983), who uses a 20-day window following the announcement date and examines acquisitions announced from 1969-1974. Andrade *et al.* (2001) divide their sample into three chronological subsamples. For the period of 1973-1979, the average return to shareholders of target firms, measured over a 3-day window, is 16%. For the 1980s, the same average return is obtained. For the period of 1990-1998, targets' announcement returns drop slightly to 15.9% but are still statistically significant.

In general, the short-run gains to target firms are significantly positive. Furthermore, once target firms are partitioned by firm and deal characteristics, including deal attitude, methods of payment and managerial ownership, these short-run gains can be characterized differently.

Firstly, Franks *et al.* (1991) document that hostile bids generate an average return of 39.39% for US target firms, which is 14.92% higher than the gains created by friendly bids. Similar results are reported by Servaes (1991) and Frank and Mayer (1996) who find that targets' gains from hostile offers outperform those from friendly offers by 9.88% and 11.32% respectively. Martynova and Renneboog (2008) then provide the rationale underlying these findings. They argue that a hostile bid gives rise to resistance from the acquired firm, which poses the potential of revising the offer price upwardly. Hence, hostile but successful deals are expected to be associated with higher premiums, compared with friendly deals. At the announcement of a hostile bid, the share of the acquired firm will immediately reflect this expectation. Therefore, targets' short-run returns are affected by deal attitude.

Secondly, in addition to deal attitude, method of payment is another factor in relation to targets' gains. For the US market, Franks *et al.* (1991) find an average announcement return of 22.88% for share deals versus 33.78% for cash deals. In a more recent research, Andrade *et al.* (2001) provide empirical evidence that short-run gains to acquired firms are on average 13%, if the bids are paid with equity; non-equity deals, meanwhile, generate an average return of 20.1% for target firms. Similar findings are reported by European takeover market based studies. For example, in the research of Martynova and Renneboog (2006), targets capture an average return



of 20.17% in cash deals, corresponding to an 11.1% in stock deals.<sup>13</sup>

Thirdly, Song and Walking (1993) examine the relationship between target shareholder returns and managerial ownership. The results from their cross-sectional regression analysis suggest that, in contested but successful acquisitions, targets' gains are positively and significantly related to managerial ownership. This finding is consistent with the early research of Stulz (1988). In explaining why this relation exists, they introduce the supply-side push and bargaining power. "Bidders face an upward sloping supply curve for shares of the target firm" (P. 452). If managers show resistance towards an offer, their ownership will force a supply-side push, which moves up the supply curve and gives rise to a higher offer price. Even without this resistance, managerial ownership can still create significant bargaining power. Such power, once being properly used in negotiating with the acquiring firms, can increase the offer price and thus shareholders' gains.

In summary, compared with the identified series of deals and firm characteristics which affect or determine short-run gains to acquiring firms, fewer attempts have been made to suggest factors that can account for targets' announcement returns. Therefore, here arises the need for the researching of identifiable additional factors that may also impact the value effects of acquired firms. In this thesis, the sentiment shown by investors (information recipients of takeover announcements) is suggested as a new determinant to further the understanding of this issue.

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<sup>13</sup> The higher targets' gains from cash deals, relative to share deals, can be a consequence of tax, on capital gains, incurred from cash payment. Tax burdens of target firms are offset by high takeover premiums offered by acquirers (Wansley *et al.*, 1983). These high premiums further lead to higher targets' returns.

## 2.4 Conclusions

By extrapolating upon traditional theories, extant literature has developed several schools of thought in theorizing and rationalizing the occurrence of mergers and acquisitions. In light of this, several theories have been proposed as explanations for the gains from mergers and acquisitions. Although these theories expose the activity (occurrence) and the performance (gains) of mergers and acquisitions to the influences of many different factors, the role of information and its implications remain fundamental to most of these theories. Given this, it would be of crucial research value to provide a thorough understanding of the relationship between information environment and corporate takeovers.

In this thesis, takeover announcements are primarily regarded as a process of disseminating firm information. The relevance of factors along this process to takeover gains constitutes the main research objective. These information related factors include information (information content signalled by takeover announcements), information sender (information asymmetry surrounding acquiring firms and information uncertainty regarding target firms), information recipient (investor sentiment involved in interpreting the information) and market condition (misvaluation). The examined hypotheses, and the associated importance in relation to these specific factors, are discussed in chapters 3, 4 and 5.

**Chapter 3:**

**The Activity and the Value Effects of UK Takeovers in the  
Presence of Misvaluation**

### 3.1 Introduction

Neoclassical theory, pertaining to the market for corporate control, has suggested a relation between corporate takeovers and macroeconomic factors (e.g., Gort, 1969; Harford, 2005). It proposes that economic disturbances, as well as technological and regulatory shocks, lead to industry reorganizations. Such an asset reallocation process can be achieved by mergers and acquisitions. Although this theory has successfully explained the movements of the US takeover market in the 1980s against its respective economic climate (Jensen, 1988), controversial views suggest that economic changes are not a necessary condition for the occurrence of merger waves. Instead, other factors, for example misvaluation, contribute to fluctuations in total takeover and reorganization activities (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004).

This misvaluation hypothesis is developed by recognizing abundant anecdotal evidence which suggest that an active takeover market coexists with a booming stock market.<sup>14</sup> Research efforts towards examining and further rationalizing the relationship between takeover activities and misvaluation, have provided empirical results that are consistent with anecdotal evidence. These results further indicated that misvaluation driven takeovers exist at a firm, industry, and market level (e.g., Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Dong *et al.*, 2006).<sup>15</sup>

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<sup>14</sup> For example, the mega-merger of American Online-Time Warner created the world's first internet-age media and communication company. This transaction leads worldwide M&A deals, in terms of deal value, since 2000. The striking \$164.747 billion transaction value was paid with AOL's then hype-inflated stocks. This deal, as the seminal transaction, contributed to the over \$1.5 trillion deals announced in that year. However, with the presence of stock market correction, this number dramatically declined to half the year after (Institute of Mergers, Acquisitions and Alliances Research).

<sup>15</sup> The great majority of literature on this issue concentrates on either market valuation (Tebourbi, 2005;

Existing research on the relation between misvaluation and the takeover market has mainly a stock merger focus. Additionally, by assuming that in making cash payments no equity issue is involved, cash mergers are naturally associated with undervaluation, while equity deals correspond to overvaluation. For example, the Shleifer and Vishny (2003) model predicts that “overvaluation can be the motive for most stock acquisition, which increase the buyer’s willingness-to-pay in stock mergers, though it has no effect in cash acquisition” (Friedman, 2004, p.1).

Nevertheless, this assumption and the conclusion based on it are debatable, since the use of cash as a payment mechanism does not necessarily mean that the actual source of the cash payment comes solely from a firm’s internal cash flow. Instead, external equity flow and debt flow serve as two financing alternatives (Schlingemann, 2004). Therefore, given the different financing sources of cash payment, the documented irrelevance of overvaluation to cash deals, which is based on the flawed assumption that no equity is involved in cash payment, is unlikely to be generalizable. Accordingly, there arises the necessity of re-examining the under-researched and mis-interpreted misvaluation effects on cash deals.

This research objective is expected to be achieved by applying the information asymmetry hypothesis. This is due to the information asymmetry hypothesis being formalized to rationalize both the misvaluation effects (e.g., Draper and Paudyal, 2008) and the value effects of payment financing (e.g., Myers and Majluf, 1984; Eckbo *et al.*, 1990), as outlined in the following paragraphs. Thus, this hypothesis is used to bridge

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Bouwman, 2006; Rosen, 2006) or firm misvaluation (Dong *et al.*, 2006; Ang and Cheng, 2006). A comprehensive view of misvaluation is provided by Rhodes-Kropf *et al.* (2005) who deconstructs misvaluation into three factors: firm specific error, time series sector error and long-run value to book, and examines the relations between merger activities and each of the components.

the identified literature gap.

Firstly, the theoretical implications of information asymmetry hypothesis shed light on both the intensity and the value effects of corporate takeovers in the presence of misvaluation. In terms of takeover intensity, Rhodes-Kropf and Viswanathan (2004) claim that misvaluation has an effect on merger activities via the mechanism of synergy-estimating errors. The estimation of the market-, sector- and firm-components of a bidder's misvaluation depends on the availability of relevant information. As information at the market level is more transparent and accessible, managers from target firms naturally overestimate the market-component of misvaluation, especially when the market valuation is high. This overestimated market valuation further intensifies the synergy-estimation errors shown by these managers. Consequently, such hyped synergy-estimation increases the possibility of target managers accepting an offer. Therefore, in general, frequent takeovers are expected during a high market valuation period.

As for the value effects, misvaluation influences takeover synergies and revaluation effects, which are two components of a bidder's announcement returns. As mentioned in the paragraph above, high market valuation breeds overestimated synergies due to information asymmetry. These overestimated synergies can temporarily enhance bidders' gains. In addition to this synergies component of bidders' announcement returns, the revaluation component has the potential of driving bidders' gains. In line with information dissemination hypothesis (Draper and Paudyal, 2008), a corporate takeover releases information to the market and consequently attracts investors and analysts to reappraise the bidder's value. If information asymmetry

impedes a bidding firm from revealing its potential to the investment community, this firm is likely to be undervalued by the market. Announcing takeovers disseminates firm information to the market and thus gives rise to an upward revaluation. Consequently, the acquirer's share price can be bidded up through this revaluation process.

Secondly, the theoretical implications of information asymmetry hypothesis shed light on the relevance of a transaction's payment method and financing source to bidders' gains. Signalling implications in the presence of information asymmetry is suggested as the primary factor underlying the stock performance of cash and equity bidders (Myers and Majluf, 1984). More specifically, the payment mechanism of a takeover is regarded as an information carrier which signals the bidder's private information to the market. Stock offers, in general, are interpreted as a sign of a bidder's overvaluation and thus raise adverse selection problems. Cash deals, on the other hand, tend to alleviate the information asymmetry concerning a bidder's value.

This value effect of the payment mechanism is later modified by Schlingemann (2004) and Martynova and Renneboog (2007) who introduce the notion of 'transaction financing'.<sup>16</sup> They report that a negative market reaction follows the announcement of a corporate takeover wherever equity financing is involved in the transaction. This suggests that, in evaluating takeover announcements, investors not only consider the information signalled by a transaction's payment method but also extract information from its financing source. For example, although cash deals, in general, send out positive signals and hence give rise to positive stock market

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<sup>16</sup> The 'transaction financing', different from 'payment method', refers to the actual financing sources of the payment made to an acquired firm.

reactions, the negative information contents of equity financed cash deals can cause a stock price revision.

Given these two groups of rationalizations of the information asymmetry hypothesis, in relation to misvaluation and payment financing methods, the information asymmetry hypothesis is expected to theorize the relevance of misvaluation to corporate takeovers conditional on payment financing methods. Thereby, the identified literature gap, discussed above, can be filled by examining the following two research questions and exploiting the information asymmetry hypothesis. These research questions concern the intensity and the value effects of takeovers respectively. Firstly, *'how does misvaluation influence the intensity and the valuation of transactions in the UK takeover market'*? Secondly, if misvaluation shapes UK takeover activities, *'does it have the same effects on transactions with different payment financing methods'*?

An insight into these questions can contribute to the ongoing debate on value effects of misvaluation, which is presented with mixed and ambiguous empirical results.<sup>17</sup> Moreover, the introduction of the 'methods of payment' and 'financing sources' combination clarifies the difference between these two factors, which has been disregarded to some extent among extant literature.

By introducing the interaction between takeovers, as an investment decision, and its financing sources, this study bears important insights and implications for corporate organizations. This will be done by suggesting some financial management

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<sup>17</sup> For extensive discussion on the documented value effects of misvaluation, see literature review section 3.2.2.2.



practices which can maximise the synergies between investment and financing decisions.

The remainder of this chapter proceeds as follows. Section 2 provides comprehensive literature review on the relation between misvaluation and takeovers and further presents hypotheses developments. Section 3 contains data descriptions and the methodologies of measuring misvaluation and transaction financing. Results from univariate tests and cross-sectional regression analyses are given in Section 5. Section 6 concludes the chapter and points out how it relates to the following empirical chapter.

## **3.2 Literature Review**

### **3.2.1 Misvaluation Related Takeover Motives**

In theorizing and rationalizing the relationship between takeovers and misvaluation, it is of primary importance to examine why such a relationship occurs. This relationship does not appear accidentally. It should be driven by the motives, of utilizing such misvaluation, shown by both parties involved in takeover transactions (i.e. bidders and targets). Accordingly, literature, on both why a bidder considers misvaluation in making takeover decisions and why a target would likely accept such a misvaluation-driven-offer, is reviewed in this section.

In examining why bidders would likely engage in takeovers in the presence of misvaluation, three explanations have been provided: i) exploiting the benefits of

overvaluation, ii) agency costs of overvalued equity, and iii) the opportunity of revaluation via information dissemination.

Firstly, the potential benefits of overvaluation can encourage a firm to engage in takeovers in the presence of misvaluation. The ‘Tobin’s Q Theory’ suggests that a high stock price is a reflection of a firm’s strong growth opportunities (Tobin, 1969). In line with this, it is predicted that overvaluation should correspond to more corporate investments. More specifically, firms exploit the advantage of overvaluation by issuing equities (Baker *et al.*, 2003). These inflated equities are then invested either under the ‘passive financing mechanism’, which is purchasing fairly priced securities, or under the ‘active financing mechanism’, which is proceeding with projects that would have negative NPV without overvaluation (Chirinko and Schaller, 2006)<sup>18</sup>. Accordingly, takeovers, being a corporate investment activity, should be exposed to these overvaluation effects.

As indicated by the ‘passive financing mechanism’, stock overvaluation suggests a low cost of equity finance. The overpriced shares are used as cheap currency to buy less overvalued real securities and assets, for example target firms in the context of corporate takeovers, to preserve some of the inflated value.

Developed upon this, the Shleifer and Vishny (2003) model is introduced to explain why, in investing the proceeds from new equity issue in the presence of overvaluation, takeovers are preferred. They suggest that takeover synergies being

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<sup>18</sup> The rationale underlying the ‘active financing mechanism’ is that overvaluations lower the costs of equity financing, and in turn WACC. Since WACC is generally used as the discount rate of future cash flow in assessing the NPV of an investment, the lowered discount rate increases the possibility that the NPV of the investment will be evaluated positively.

positively perceived by the market<sup>19</sup>, as well as the potential earning growth, which can justify high valuations, make takeovers a favorable choice for rational managements. Accordingly, this model proposes that the likelihood of merger and acquisition transactions is positively related with overvaluation. Moreover, this rational managerial decision to merge brings positive long-run incremental returns to acquirers' shareholders and thus serves their best interests.

Exploiting this line of research, Ang and Cheng (2006) further examine this takeover motivation, in relation to misvaluation, by testing the hypothesis that stock bidders' shareholders are at least as well off as the shareholders of similarly overvalued non-acquiring firms. They report that when the rationality condition<sup>20</sup> is satisfied, acquiring firms outperform their counterparts on the same misvaluation scale, regardless of whether their stock abnormal returns are measured around announcement periods or over the long-run. In line with Shleifer and Vishny (2003), this empirical result suggests that exploiting the benefits of overvaluations is a possible incentive underlying bidders' takeover decisions. Takeovers driven by this motivation generate beneficial outcomes for acquiring firms.

Secondly, agency costs of overvalued equity can encourage a firm's engagement in takeovers in the presence of misvaluation. Although, under both the 'passive financing mechanism' and the 'active financing mechanism', firms issue new equities by timing the stock market and further finance their investments with the proceeds, the

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<sup>19</sup>. The synergies estimation is under the influences of market valuation. Synergies tend to be overestimated when the market valuation is high (Rhodes-Kropf and Viswanathan, 2004). For extensive discussion on this issue, see section 2.1.2.

<sup>20</sup>. The rationality condition is when "an opportunistic stock acquirer gains only if its overvaluation exceeds the target's overvaluation and the merger premium. That is: Acquirer's overvaluation > target's premium-adjusted overvaluation" (Ang and Cheng, 2006, p.200).

use of inflated equities is not the sole motive of corporate investments in the presence of misvaluation. For example, managers may overinvest to stimulate optimistic market expectations (Jensen, 2005). Specifically, managers have the ability to correct any overvaluation; yet this will consequently disappoint the market. Therefore, eliminating overvaluation is likely to cause a substantial loss for existing shareholders and other stakeholders. Due to this pressure, they are prone to meet the market expectation and further to manipulate a high growth and value-creating illusion. This is achieved by engaging in excessive investments, which may even have negative net present value. An expansion in takeover activity, and the high possibility of engaging in value destroying acquisitions, is a likely outcome of this overinvestment.

Accordingly, contrary to the value maximization view of mergers and acquisitions suggested by the Shleifer and Vishny (2003) model, Jensen (2005) argues that acquisitions, motivated by the agency costs of overvalued equity, tend to be detrimental to shareholders of bidding firms. Moeller *et al.* (2003) and Song (2007) support this argument by providing empirical evidence of overvalued bidders exhibiting poor long-term stock returns and operating performances. They rationalize this finding by appealing to the market realizing the created illusion. More specifically, since the created growth illusion by an overvalued bidder cannot constantly convince the market, not only will the overvaluation disappear but it will also prove detrimental to the value of the bidder's shareholders. This further leads to a violent drop in the firm's value.

Thirdly, revaluation via information dissemination can encourage a firm to engage in takeovers in the presence of misvaluation. Both the 'passive financing mechanism' and agency costs of overvalued equity associate takeover motives with

overvaluation. Conversely, information dissemination hypothesis suggests undervaluation as a driving force of takeover activities. If information asymmetry impedes a firm from revealing its potential to the market, this firm is likely to have undervalued securities. Managers of this firm, once recognizing the undervaluation, have strong motives to release good news to the market and thus attract the attention of the investment community. Investors then reappraise the firm's value based on the arrival of new information. This revaluation process will eventually drive up the firm's share price. Applying this information dissemination hypothesis in a takeover context, Draper and Paudyal (2008) suggest that corporate takeover announcements, compared with additional information release, can guarantee a wide coverage and secure the occurrence of such a revaluation process. Accordingly, managers from a bidding firm, with undervalued equities, will take this opportunity of revaluation to announce takeovers and disseminate firm information to the market.

As already mentioned, both the low cost of equity finance and the agency costs of overvalued equities stimulate overvalued firms to take part in the takeover market. But why would a target likely accept the overvalued offer? Two explanations, based on correlated misinformation and different managerial horizons respectively, have been proposed.

The managerial decisions, on whether to accept an offer or not, are partly based on their estimated synergies from available information. Accordingly, the willingness of managers from a target firm to accept an overpriced offer may stem from their mis-estimated synergies of the combined unit. This synergy-estimating error, as suggested by Rhodes-Kropf and Viswanathan (2004), can be magnified by a high

market valuation. Managers from a target firm, although fully aware whether the bidder is overvalued, are not able to deconstruct the market-, sector- and firm-components of misvaluation. As information at a market level is more transparent and accessible, they naturally overestimate the market-component of misvaluation and hence the created synergies, especially when the market valuation is high. Therefore, these overrated synergies increase the possibility of accepting a bid.

Even if managers from a target firm can successfully weigh each component of misvaluation, there is still a chance that they will accept the inflated offers. This is because, managers, who are self-interested and concern themselves with short-term gains, may hope that the overpriced equity can be cashed out quickly (Shleifer and Vishny, 2003). In this case, shareholders from the target firm may not suffer a loss from holding these overvalued shares during the takeover announcement period, yet almost no gain can be seen in the long-run.

In addition to the relatively shorter managerial horizon, managers from target firms are likely to accept the overvalued offers if there are extra benefits for them to capture. Acquirers may pay them for agreeing to the deals in the forms of stock options, severance pay, reservations of top positions (e.g., Shleifer and Vishny, 2003), or personal wealth increase (e.g., Hartzell *et al.*, 2004).

In summary, literature on misvaluation in the takeover market consistently suggests that acquiring firms are inclined to engage in takeovers in the presence of a high market valuation or an overvaluation, although such an inclination comes from different motivations. On the other hand, acquired firms are prone to accept the offers

announced by overvaluation motivated bidders, although their willingness to accept these offers stems from different considerations.

### **3.2.2 Relevance of Misvaluation to the Intensity and the Value Effects of Takeovers**

As discussed in the above section, misvaluation related takeover motives can explain why the relationship between takeovers and misvaluation occurs. These motives can further quantify such a relationship by shedding light on the activity and the value creation of corporate takeovers in the presence of misvaluation. Related literature is reviewed in this section, including research towards examining the relevance of misvaluation to both the intensity and the value effects of takeovers.

Transaction intensity refers to the fluctuations in total takeover activities. Such fluctuations, presented by takeover waves, have persisted in the market for corporate control over the past several decades. The trend of mergers clustering during high stock market valuation periods has been rationalized by the theoretical models formalized by Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004).

The Shleifer and Vishny (2003) model, as previously mentioned, regards positively perceived synergies and potential earning growth during high valuation periods as the motives driving a firm to engage in the takeover market. Furthermore, targets are willing to accept these overvalued offers due to their managers' self-concerns. These two motives, from both a bidder's and a target's perspective, suggest a relation between high takeover intensity and high valuation. This model

elucidates the acquisition experiences in the US market, particularly the conglomerate merger wave in 1960s and the merger surge in the second half of the 1990s. Both of these takeover movements took place during a period of rising stock market valuations.

This relation is later confirmed by the Rhodes-Kropf and Viswanathan (2004) model. As above discussed, it regards hyped synergy-estimates as the driving force of a firm's involvement in the takeover market. According to it, the mis-estimated synergies, which increase with market valuation, lead to active merger activities during high market valuation periods.

More systematic empirical evidence is provided by Rhodes-Kropf *et al.* (2005). They deconstruct misvaluation into three components: the firm-specific pricing deviation from short-run industry pricing (firm-specific error), sector-wide, short-run deviation from long-run pricing (time series sector error), and long-run sector pricing to book (long-run value to book). Concerning a sample of US mergers and acquisitions announced from 1978 to 2001, they examine the relevance of misvaluation to the intensity of takeovers. Their empirical findings, based on a probit regression analysis, indicate that merger intensity is positively correlated with the firm-specific error and the time series sector error.

To summarize, several theoretical models have been applied to explain takeover intensity in the presence of misvaluation. Although these theoretical models and the takeover motives underlying them are different, they all suggested a relation between high takeover intensity and high valuation / overvaluation.



Compared with the theoretical implications on transaction intensity, the effects of misvaluation on merger performance are presented with more mixed empirical results (as shown in Table 3.1). Literature on the value effects of misvaluation is reviewed in the paragraphs below.

Mergers, motivated by the low finance costs in the presence of overvaluation, are likely to be associated with high takeover premiums. This is because bidders, once overvalued, are capable of offering a higher premium due to their loose capital constraints. These high premiums, in turn, lead to low returns for acquiring firms (Dong *et al.*, 2006).

This relationship between overvaluation and low bidders' gains can also be explained by the information asymmetry surrounding bidding firms. As suggested by Ali *et al.* (2003), a market correction follows the arrival of new public corporate information. Therefore, a takeover announcement is expected to alert investors to a bidder's pre-existing misvaluation and thus cause partial corrections to this prior-mispricing. Accordingly, lower bidder announcement-period returns should correspond to bidders' overvaluation (Dong *et al.*, 2006).

In line with this research, Draper and Paudyal (2008) report that undervalued bidders outperform their overvalued counterparts in the short-run. This is because, with the existence of information asymmetry between an undervalued bidding firm and investors, a corporate takeover releases information to the market and consequently attracts investors to reappraise the bidder's previously undervalued equity. This, in general, raises the bidder's stock price around the announcement

period.

However, this widely documented empirical result, which overvalued bidders tend to underperform, is questioned by Ang and Cheng (2006). They point out that there are differences between the market price corrections to overvaluation and the evidences of underperformance. Accordingly, a methodology of comparing the difference in short-run returns between acquirers and non-acquiring firms, which are on a similar scale of overvaluation, is employed in their study. In line with the prediction of the Shleifer and Vishny (2003) model, they posit that takeovers serve the best interests of shareholders from overvalued bidding firms, since their abnormal returns are higher than their counterparts from non-acquiring firms. In particular, when the rationality condition<sup>21</sup> is applied, these acquirers capture positive abnormal returns both around the announcement periods and in the long-run.

In all these aforementioned studies (Ang and Cheng, 2006; Dong et al, 2006; Draper and Paudyal, 2008), misvaluation is measured at a firm level. However, when this line of research is developed to a market valuation context, different empirical results are presented.

Concerning the Canadian takeover market, Tebourbi (2005) provides evidence that acquisitions announced in a booming stock market generate positive announcement abnormal returns to bidders. Investors' behaviour is then used to rationalize this positive effect. More specifically, investors tend to be over-optimistic during a high valuation period, which gives rise to a high announcement period return

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<sup>21</sup> For explanations on the rationality condition, see section 3.2.1.

for a bidding firm following high recent returns in the stock market.

Similar empirical results are documented by Bouwman *et al.* (2006), who report that short-run stock returns, long-run stock returns and long-run operating performances of low-market and high-market acquisitions, are fundamentally different. More specifically, announcing acquisitions in a high market period generates significantly higher announcement returns to acquiring firms than low-market acquisitions. However, these bidders' gains do not persist beyond the takeover announcement period, as they are followed by significantly lower long-run abnormal returns and poorer long-run operating performances. 'Managerial herding' is then employed to explain the underperformance of high-market acquisitions. It suggests that, if a large number of firms are involved in mergers and acquisitions, subsequent firms will follow the trend while ignoring their own motives and not fully considering the valuations of this investment decision. Therefore, the underperformance of high-market acquisitions is primarily driven by the low stock returns to firms acquiring later in a high-market merger wave.

This negative long-run effect of high market valuation is also reported by Rosen (2006). He attributes these market reactions to the influences of investor sentiment. Specifically, "when investor expectations are based more on optimistic expectations than reality, the short-run boost in price caused by a merger announcement is reversed in the long-run as the track record of the merger becomes known" (p.1016).

To summarise, different components of misvaluation shape takeovers in different ways. The firm-component of misvaluation is in general inversely related to bidders'

gains; the industry- and market-components of misvaluation drive up bidder's announcement returns. Although several theories or hypotheses have been suggested to theorize the valuation effects of misvaluation, it is only the information asymmetry hypothesis that can comprehensively rationalize the driving force of each component of misvaluation. At a market or industry level, a high market valuation breeds overestimated synergies due to information asymmetry (Rhodes-Kropf and Viswanathan, 2004). These overestimated synergies can temporarily enhance bidders' gains. At a firm-specific level, corporate takeovers release information to the market and consequently attract investors and analysts to reappraise bidders' values. If a bidding firm is previously undervalued, its share price can be bid up through this revaluation process (Draper and Paudyal, 2008).

### **3.2.3 Value effects of Payment Financing Methods**

The above mentioned theoretical implications of the information asymmetry hypothesis can rationalize the relevance of misvaluation to the intensity and the value effects of takeovers. Given the research objective of this chapter, this relevance is then examined conditional on payment financing methods. This examination starts by reviewing the documented value effects of payment financing methods in light of the information asymmetry hypothesis.

There is a largely unanimous agreement in literature that, from a bidder's perspective, equity acquisitions are associated with significantly negative abnormal returns which substantially underperform cash bids (e.g., Franks *et al.*, 1991; Andrade *et al.*, 2001; Bouwman *et al.*, 2003).

Signalling implications, in the presence of information asymmetry, are suggested as the primary factor underlying the stock performance of cash and equity bidders (Myers and Majluf, 1984). Acquiring firms may have private information which is unknown to the market. The unevenly distributed information gives rise to the possibility that managers, who possess the private information that their firm's shares are overvalued, will use these inflated shares to acquire a target firm. Investors then interpret the signals conveyed by this equity payment and further evaluate the prospects of the acquirer based on their interpreted information. After recognizing the adverse selection problem, they will consequently evaluate the acquiring firm downwardly. Therefore, negative returns are associated with bidders making equity deals. Cash deals, on the other hand, assure investors and target firms that the bidder's equity is not overvalued. This, thus, clarifies the information asymmetries concerning the bidder's value. As a consequence, the stock market reacts positively to cash deals.

Counter-arguments arise with more recent research developments on this issue. They suggest that the documented positive value effects of cash payment may not be generalizable due to the fundamental difference between the payment mechanism of a transaction and its financing sources. More specifically, cash deals can be financed by a firm's internal cash flow, debt flow or equity flow (Schlingemann, 2004). If investors can recognize the different financing sources of a cash deal, the information signalled by this transaction financing is also expected to be reflected by the bidder's share price, and in turn influences the bidder's gains.

Further attempts have been made to examine this effect. After associating each offer with its own financing source, Martynova and Renneboog (2007) claim that

returns generated by cash deals with different financing sources are dissimilar. The results, from their OLS regression analyses, show that a negative market reaction follows announcements of any corporate takeover which involves equity financing. This is because, in evaluating a takeover announcement, investors interpret the information signalled by both the payment method and the financing sources of the transaction. Even though the positive information embodied in cash deals gives rise to positive stock market reactions, the negative information contents of equity financed cash deals lead to a stock price revision.

#### **3.2.4 Misvaluation Effects conditional on Payment Financing Methods; Hypotheses Development**

The theoretical implications of information asymmetry hypothesis on both the value effects of misvaluation and the payment financing methods have been discussed in the previous subsections. In light of these implications, the identified literature gap<sup>22</sup> is then filled by examining the effects of misvaluation conditional on payment financing methods. In this process, hypotheses related to the intensity and the value effects of takeovers are developed.

Along the line exploited by Rhodes-Kropf and Viswanathan (2004), misvaluation sets effects on merger activities via the mechanism of synergy-estimating errors. The estimation of the market-, industry- and firm-components of a bidder's misvaluation depends on the availability of relevant information. As information at a macro-level is more transparent and accessible, managers from the target firms will naturally

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<sup>22</sup> The literature gap identified is where the relevance of misvaluation to takeovers, conditional on payment financing methods, has been either misinterpreted or under-researched. For intensive discussion on this issue, see section 3.1.

overestimate the market- or industry-component of misvaluation, especially when the market or industry valuation is high. This overestimated market or industry valuation further leads to a hyped synergy-estimation, which increases the possibility of completing a bid. Therefore, a high market or industry valuation breeds overestimated synergies and, in turn, boosts merger activities. This over-estimated synergy should equally be applied to transactions with different payment financing methods. Accordingly, it is logical to expect that:

Hypothesis (1): Merger intensity, in general, is high during a period when market or industry valuation is high.

In addition to takeover intensity, misvaluation is hypothesized to influence bidders' gains via information asymmetry. Specifically, the estimated synergies created by the resultant entities, and the revaluation effects of takeover announcements, are two components of bidders' announcement returns (Draper and Paudyal, 2008). In the presence of information asymmetry, misvaluation influences both of these components.

Firstly, as already mentioned, high market valuation breeds overestimated synergies due to information asymmetry (Rhodes-Kropf and Viswanathan, 2004). These overestimated synergies can temporarily enhance bidders' gains around the announcement period. The driving force of these overestimated synergies suggests that:

Hypothesis (2): Transactions announced during high market or industry periods are associated with higher announcement period returns, compared with low-market or -industry acquisitions.

Secondly, a corporate takeover releases information to the market and consequently attracts investors and analysts to reappraise the bidder's value. If information asymmetry impedes a bidder from revealing its potential to the investment community, the equity of this bidder is likely to be undervalued due to the lack of information. Announcing takeovers can disseminate the firm's information to the market. Investors, once attracted to the newly released information, will reappraise the value and the growth opportunities of the bidder (Draper and Paudyal, 2008). The direction of this revaluation depends on both the potential of the bidder and the signals sent out by the takeover announcement. If the acquirer has true potential, releasing good news can bid up its share price via revaluation. On the other hand, bad news released will struggle to drive up the firm's share price through revaluation.

As widely acknowledged, cash deals, in general, are interpreted by investors as a positive signal; equity bids are regarded as a negative sign (Myers and Majluf, 1984). Meanwhile, in evaluating takeover announcements, investors are able to interpret the information signalled by the financing sources of a transaction (Schlingemann, 2004; Martynova and Renneboog, 2007). Hence, with regard to cash deals, investors extract negative information from equity financed cash deals and positive information from non-equity financed cash deals.

Given the different nature of information that can possibly be signalled by takeover transactions, revaluation effects should lead bidders' gains into different directions depending on different payment financing methods. More specifically, the following hypotheses are expected.

Hypothesis (3): For non-equity financed cash deals, undervalued bidders outperform



their overvalued counterparts.

Hypothesis (4): For both share deals and equity financed cash deals, undervalued bidders do not outperform their overvalued counterparts.

### **3.3 Data and Methodology**

#### **3.3.1 Sample Selection and Descriptions**

In order to test the raised hypotheses, merger and acquisition data is collected from Thomson Financial. 50,760 bids were announced by UK companies during the period of 01/01/1989 to 31/12/2007. The following sample selection criteria are then applied to these observations.

- (1) Acquirers are listed for trading on the UK stock market, namely LSE, AIM, USM and London Tech, which reduces the sample size to 22,208 observations.
- (2) The deal value of a transaction is no less than £1 mil, and information regarding transactions' payment methods must be available. 10,388 bids survive these criteria.
- (3) A minimum size criterion that a bidder's market value is more than £1 mil excludes 1940 bids.
- (4) Acquirers' stock return index and balance sheet items must be available from DataStream, for the purpose of transaction financing identification and value

effects analysis.

A final sample consisting of 6086 transactions is generated through this sample selection process. In addition, data regarding new equity issue during the period of 1988-2006 are obtained from the SDC database to help identify a transaction's financing sources.<sup>23</sup>

Table 3.2 shows that 2936 out of 6036 (48.24%) UK takeovers are cash deals; share deals only make up 6.15% of the total transactions.<sup>24</sup> According to studies based on the US takeover market, the proportion of equity deals is generally above 70%. The fact that UK acquirers exhibit a greater inclination to use cash as a payment mechanism than their US counterparts is consistent with extant research (e.g., Faccio and Masulis, 2005). In terms of transaction financing, over 1/8 of the 6086 bids are financed with pre-acquisition equity issue. The difference in the amount of share deals (374) and equity issue financed deals (786) reveals the fundamental difference between payment methods and financing sources of takeover transactions. This thus addresses the necessity and the importance of differentiating these two concepts, which are assumed to be the same in most of the existing literature. A clarification of these fundamental differences will be made in this chapter by examining the effects of misvaluation conditional on a hybrid of a transaction's payment method and financing

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<sup>23</sup> For explanations on the rationale of using equity issue data to identify a transaction's financing source, see section 3.3.3.

<sup>24</sup> According to the UK Takeover Code, cash consideration is made mandatory in acquiring a public target if a bidder holds over 10% interests of the acquired firm over the offer period or 12 months before the announcement. In this case, the offer should be in cash or accompanied by a cash alternative not less than the highest price paid by the bidder or any competitor during the offer period and within the 12 months prior to the announcement. Out of the 6086 observations of this study, there are 429 cash deals in acquiring public targets, of which 29 (92) bidders have less (more) than 10% interests of the targets before announcements and 308 with unavailable information. Due to the data availability, distinguishing legally- or spontaneously-made cash deals become infeasible, therefore all of these 429 observations are included as cash deals.

source.<sup>25</sup>

Takeover activities classified by both payment mechanism and transaction financing are reported in Table 3.3 on an annual basis. Market and firm misvaluation in the corresponding years are also included. It is evident from the table that there are substantial variations in both the takeover intensity and the misvaluation during the sample period. Moreover, UK takeover activities cluster when the stock market is booming (1999-2000) and become inactive during sluggish stock market periods (2002-2004), although some exceptions exist. Such fluctuations in the UK takeover market are preliminary findings lending support to Hypothesis (1) which suggest that market valuation shapes takeover intensity in the UK market. More rigorous analysis on testing this hypothesis will be provided in subsection 3.4.1.

### **3.3.2 Measurements of Valuation**

Researchers have been engaged in developing appropriate measurements of misvaluation. In most cases, they concern themselves solely with misvaluation at either a firm or a market level. This one-tiered misvaluation, as suggested by Bouwman *et al.* (2006), is inadequate to provide a coherent description of the value effects of misvaluation.

Bouwman *et al.* (2006) report that, in the long-run, bidders of high market acquisitions underperform those of low market acquisitions. Nevertheless, when firm

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<sup>25</sup> Table 3.2 also shows that acquisitions of unlisted companies dominate the UK takeover market. Moreover, domestic transactions overweigh cross-border deals. In addition, UK acquirers, on average, hold a market capitalization of £1581 mil, which is 15 times of their transaction value.

misvaluation is introduced, the outperformance of low market acquisition is no longer constant. Overvalued bidders, who announce their acquisitions in low market months, do not significantly outperform undervalued bidders who make transactions in high market periods. These empirical results highlight that the value effects of the firm- and the market-components of misvaluation are dissimilar. Hence, here emerges the need of deconstructing misvaluation in finance research. Therefore, similar to the deconstruction of misvaluation into firm specific error, time series sector error and long-run value to book by Rhodes-Kropf *et al.* (2005), misvaluation is measured at a market-, industry- and firm-level in this study. This three-tiered system can help to present a comprehensive view of misvaluation effects.

### **3.3.2.1 Market and Industry Valuation**

Proxies of market and industry valuations have been offered in abundant literature, out of which PE and PB ratios are the most frequently employed measurements. PB ratio is regarded as a less noisy measure, as it reflects mispricing, risk and differential in unconditional expected cash flow (Daniel *et al.*, 2001). However, it is exposed to the influence of firm or industrial accounting differences. In particular, the PB ratio is less meaningful for firms and industries with a high proportion of intangible assets, as intangible assets cannot be reflected by book value. Moreover, the book value is likely to be associated with manipulations and backward-looking information (Lee *et al.*, 1999).

The PE ration, on the other hand, has been heavily relied on in both academia and industry. Although there are some arguments around the use of PE ratio, for

example it implies that expected growth is affected by current profitability (Penman, 1996), the exception from the influences of industrial and firm accounting difference still makes it a reliable indicator of market-and industry-level valuation.

However, the simple use of raw PE ratios to examine variations in market and industry valuation may not be appropriate. This is because the upward trend of PE ratios may naturally associate more recent periods with high market- or industry-valuations (Bouwman *et al.*, 2006). Consequently, detrending the PE time series becomes necessary.

Following Bouwman *et al.* (2006), monthly P/Es of 10 industries<sup>26</sup> and FTSE ALL share are detrended by removing the best-straight-line from these time series. Each of these detrended PE ratios is then compared with its past 5-year average value. Accordingly, the ‘Above (Below) Average’ group is categorized. The top (bottom) half of the ‘Above (Below) Average’ observations falls into the ‘High (Low)-Market/Industry’ group and the rest constitute the ‘Neutral-Market/Industry’ group. This market/industry valuation measurement generates 41 ‘High Market’ and ‘72 ‘Low Market’ valuation months during the sample period; and categorizes 433 ‘High Industry’ and 681 ‘Low Industry’ valuation months on a 10-industry basis, according to the ICBN Industry Classification.

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<sup>26</sup> These 10 industries are identified according to ICBN Industry Classification, including Oil&Gas, Industrial, Financials, Health Care, Consumer Services, Consumer Goods, Materials, Technology, Telecom and Utility.

### 3.3.2.2 Firm Misvaluation

Various firm misvaluation measurements based on financial ratio analysis and dividend discount model have been introduced. Among all of the alternatives, the residual income model seems to be a comprehensive misvaluation proxy<sup>27</sup> Compared with PE and PB ratios, it is invariant to accounting treatments (Ohlson, 1995) and better predicts future earnings (Lee *et al.*, 1999). However, the consensus analysts' earning forecasts, as a component of this residual income model, can give rise to a severely biased earning forecast and hence impede the accuracy of this proxy (Ang and Cheng, 2006).

Given this, the widely used PB ratio differential is then employed to measure firm misvaluation in this study.<sup>28</sup> A primary component of this PB ratio differential is the firm-industry difference, which represents the valuation of a particular firm relative to its industry average. As previously mentioned, PB ratio is sensitive to industrial difference; therefore a control for cross-sectional difference is required. Taking this into consideration, Ang and Cheng (2006) measure firm misvaluation as  $(PBit - PBjt) / PBit$ , where *i* stands for stock *i* and *j* stands for the industry *j* to which *i* belongs in the month prior to bid announcement.

However, according to this calculation, there is the possibility that a firm with negative PB ratio will be classified as overvalued, so long as the industry PB ratio is

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<sup>27</sup> The residual income model (RIM) measures misvaluation as the standardized percentage difference between stock market price and its rational price or fair value. This fair value is the sum of the book value of equity and the discounted future earnings in excess of the returns required by its capital providers (residual incomes). For the use of this RIM, see for example Ang and Cheng (2006), Dong *et al.* (2006) and Lee *et al.* (1999).

<sup>28</sup> For the use of PB ratio in measuring misvaluation, see for example Ang and Cheng (2006), Daniel *et al.* (2001) and Dong *et al.* (2006).

positive. In order to eliminate the likelihood of this mis-measurement, the firm P/B should be substituted with the industry P/B to scale the firm-industry P/B difference. The industry-adjusted P/B differential, as in equation (3.1), is then employed as the firm misvaluation proxy in this study.

$$\text{Firm Misvaluation} = (PB_{it} - PB_{jt}) / PB_{jt} \quad (3.1)$$

In line with the methodology employed in categorizing market and industry valuation, the top (bottom) half of the ‘Positive (Negative) Industry-adjusted P/B Difference’ is classified as the ‘Over-(Under-) valuation’ group. The rest of the firms are categorized as ‘Around Equilibrium’. This gives 1291 ‘Overvalued Firms’, 1752 ‘Undervalued Firms’ and 3043 ‘Around Equilibrium Firms’.

### 3.3.3 Measurements of Pre-acquisition Financing

The inability to link a pound raised to a pound spent in takeovers is acknowledged. Although it is almost impossible to establish a one-to-one relationship between transaction value and transaction financing, an approximate relation between a transaction and its financing source can still be created by measuring transaction financing with pre-takeover equity issues or changes in the balance sheet (Baker and Wurgler, 2002; Schlingemann, 2004).

In line with Schlingemann (2004), acquirers’ new equity issues, held in SDC New Issue database, 1 year prior to acquisitions are employed as a proxy of equity financing. Alternatively, based on balance sheet items, equity flow is calculated as:

$$\text{Equity Flow} = (\Delta \text{ book value of equity} - \Delta \text{ retained earnings}) / \text{assets} \quad (3.2)$$

where retained earnings are:

$$\text{Retained Earnings} = \text{Net Income before Extraordinary Items and Preferred Dividends} - \text{Extraordinary Items} - \text{Common and Preferred Dividends} \quad (3.3)$$

Similarly, in order to measure cash financing and debt financing, cash flow and debt flow are calculated based on balance sheet items as:

$$\text{Cash Flow} = \Delta \text{retained earnings} / \text{assets} \quad (3.4)$$

$$\text{Debt Flow} = \Delta (\text{assets} - \text{book value of equity}) / \text{assets} \quad (3.5)$$

### 3.3.4 Measurements of Bidders' Gains

Market-adjusted model, CAPM and Fama-French three-factor model have been used as the benchmark return model in the short-run approach of measuring bidders gains.<sup>29</sup> Although, compared with the simple market-adjusted model, CAPM and Fama-French three-factor model can account for systematic risks, they may not necessarily provide more precise measurements. More specifically, for both of these models, their parameters need to be estimated over a pre-acquisition period. Given that the UK takeover market is dominated by moderately acquisitive bidders,<sup>30</sup> who announce more than one transaction, there is a high probability that previous takeover attempts will be included in the estimation period. Hence, this will make beta estimation less meaningful. Therefore, following Fuller et al. (2002), Sudarsanam and Mahate (2003) and Conn *et al.* (2005), this study estimates abnormal return based on a market-adjusted model by subtracting the value-weighted market return from the

<sup>29</sup> For intensive discussion regarding the use of this short-run approach, rather than a long-run approach, of measuring bidders gains, see section 2.3.1. For the use of market-adjusted model, see Franck and Harris (1989), Chang (1998), Fuller et al. (2002) and Conn et al. (2005). For the use of Fama-French three-factor model, see Draper and Paudyal (2004). For the use of CAPM, see Gregory (1997).

<sup>30</sup> For empirical evidence on the acquisitiveness of UK acquirers, see section 5.3.1.



firm's stock return, as in the following equation:

$$AR_i = R_i - R_m \quad (3.6)$$

### **3.4 Empirical Results**

#### **3.4.1 Merger Intensity and Misvaluation**

This research, on the relevance of misvaluation to the intensity and the value effects of takeovers conditional on payment financing methods, starts by testing the first hypothesis, which examines the relationship between merger intensity and misvaluation. In line with the preliminary findings based on sample descriptive data (as in section 3.3.1), Figure 3.1 demonstrates that market valuation and takeover volume generally move in a similar trend. As illustrated by the tendency lines, the takeover market and the stock market experience the same recovery and contraction periods, although the prosperity in the UK takeover market (during the period of 1994-1998) corresponds to the stock market's fluctuations around a low valuation level. Moreover, such a co-movement is also presented by cash deals and market valuation, which suggests market valuation as the driving force of UK cash deals.

In addition to examining the tendency of takeover activities and misvaluation fluctuations, a univariate test for merger frequency is included by comparing takeover frequencies during different valuation periods. The methodology in relation to measuring misvaluation, as mentioned in section 3.3.3.2, assigns each month in the sample period with a valuation classification (High, Neutral or Low Market) according to the detrended market PE ratio in that month. Similarly, on an industrial

basis, each month is assigned with a High, Neutral or Low Industry Valuation classification, corresponding to the detrended PE ratio of that industry in that month. The number of these market and industry valuation months is then used to calculate merger frequency. Number of transactions per valuation month is then measured as the number of deals announced in one particular valuation period divided by the total months of this valuation period. For example, the number of transactions per high market valuation month is calculated as the number of deals announced during high market valuation periods scaled by the total number of high market valuation months in the sample.

This takeover frequency, conditional on misvaluation, is presented in Table 3.4. It shows that more transactions take place during high valuation periods than in low valuation periods, which is significant at both market and industry levels. For example, each high market month has 41.37 transactions on average, which is more than double the frequency in low market months. When the sample is portioned by deal characteristics, this driving force of high valuation exists among almost all payment financing categories.<sup>31</sup>

In general, these findings based on univariate tests show that misvaluation shapes the UK takeover market in terms of transaction tendency and frequency. More specifically, as posited by Hypothesis (1), acquisition activities move together with market and industry valuations and cluster during the periods of high market or

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<sup>31</sup> Table 3.4 shows that takeovers are generally more frequent during high market- and industry valuation months, although an inconsistency exists. With regard to equity issue financed cash deals, the number of transaction per month is 1.61 (0.13) during low and 1.27 (0.11) during high market (industry) valuation months. However, this difference in takeover frequency is too marginal to suggest a general conclusion that there are more equity financed cash deals during low market or industry valuation period.

industry valuation. These results are consistent with the empirical findings concerning the US market (e.g., Rhodes-Kropf *et al.*, 2005; Ang and Cheng, 2006) and the Canadian market (e.g., Tebourbi, 2005). However, the reported high valuation driven cash transactions are inconsistent with literature which associates cash deals with undervaluation (Shleifer and Vishny, 2003). This inconsistency is attributable to the three-tiered system of misvaluation examined in this study. The relation between undervaluation and cash deals might exist at a firm-specific level.<sup>32</sup> However, once the market- and industry-components of misvaluation are addressed, cash deals are exposed to the influences of a high valuation.

Moreover, this inconsistency, together with the reported comovement between the market- and industry-valuation and takeover intensity, can be rationalized by information asymmetry. Information asymmetry surrounding an acquiring firm impedes the target firm's and investors' synergy-estimating. As indicated by Rhodes-Kropf and Viswanathan (2004), the synergy-estimating errors are magnified by high valuations.<sup>33</sup> Accordingly, a high market- or industry-valuation breeds overestimated synergies which, in turn, boost takeover activities. Therefore, these overestimated synergies lead to a comovement between transaction frequency and the market- or industry-valuation. Furthermore, such effects are applicable to transactions with different payment financing methods.

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<sup>32</sup> The relation between firm-specific undervaluation and cash deals is not generalizable. For intensive discussion on this issue, see section 3.4.3.

<sup>33</sup> For explanations on why the synergy-estimating errors are magnified by high valuations, see section 3.2.1.

### 3.4.2 Bidders' Gains and Market- & Industry-Valuation

Having examined the relevance of misvaluation to takeover intensity (Hypothesis (1)), results from testing the second hypothesis are then presented in this subsection. Specifically, the influences of the market- and industry-valuation on bidders' announcement returns are examined. As illustrated in panel A-C of Table 3.5, all acquisitions have an average announcement return of 1.091%. This positive return is likely to be driven by transactions announced during high market and industry valuation periods. At an aggregate level, stock returns generated by acquisitions during a high market period are 0.423% higher than those in a low market period.<sup>34</sup> Moreover, high industry acquisitions generate an average announcement return of 1.225%; while a lower return (0.668%) is reported for low industry acquisitions. There is a monotonic increase in bidders' gains with an increase in industry valuation. Moreover, the outperformance of acquisitions announced during high industry valuation periods, relative to those announced during low industry periods, is at a significant level of 5%.

The value effects of misvaluation are then examined conditional on payment financing methods. As shown in Table 3.5, both cash deals and non-equity financed cash deals generate significantly higher returns during high-market and high-industry valuation periods.<sup>35</sup>

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<sup>34</sup> This difference in bidders' gains is not significant between high- and low-market acquisitions. The insignificance may due to the industrial differences which acquiring firms are exposed to. Stock returns of acquiring firms are more sensitive to the valuation condition of the industry to which they belong.

<sup>35</sup> Contrary to the findings on cash deals and non-equity financed cash deals, equity acquisitions and equity financed cash bids announced during high market- or industry-valuation periods do not significantly outperform those announced in low market- or industry-valuation periods. This can be attributed, during high market- or industry-valuation periods, to targets being just as overvalued as

Consistent with Hypothesis (2), the empirical results suggest that the stock market, in general, reacts more favorably upon acquisitions announced during high valuation periods than those announced during low valuation periods. This finding is similar to the empirical evidence reported for the US and the Canadian markets (e.g., Tebourbi, 2005; Bouwman *et al.*, 2006). In line with the aforementioned theoretical implications of information asymmetry in rationalizing the intensity of UK takeovers, this positive reaction can be attributed to the synergy-estimating errors caused by asymmetric information surrounding acquiring firms. A high valuation can further amplify these synergy-estimating errors. In particular, a high market valuation breeds overestimated synergies, which in turn bid up acquirers' announcement period returns.<sup>36</sup>

### 3.4.3 Bidders' Gains and Firm Misvaluation

Having found the influence of the market- and industry-components of misvaluation on bidders' gains, Hypothesis (3) is then tested in this subsection which examines the effects of firm-specific misvaluation on bidders' announcement returns. As shown in panel D of Table 3.5, bidders' gains increase monotonically with the decrease in firms' misvaluation. Undervalued bidders, on average, experience a significant short-run gain of 1.675%. This abnormal return, over a 5-day event

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those bidders who offer equity or equity financed cash payment. Acquirers' private information about their equities' overvaluations is embodied in equity deals and equity financed cash deals. Aware of the use of this inflated payment, the reason why a target would still likely accept the offer is that this target's asset is just as overvalued as the bidder's. Therefore, announcing equity or equity financed cash bids during high valuation periods does not generate superior returns to acquiring firms, compared with low valuation period-acquisitions.

<sup>36</sup> In addition to information asymmetry, investor sentiment (optimistic investors) can bid up bidders' gains during high valuation periods. Although the explanation stemming from investment sentiments (Tebourbi, 2005; Rosen, 2006) sheds lights on the relations between market valuation and the value effects of takeovers, it fails to rationalize the performance of takeovers when misvaluation is at a firm-specific level. Instead, information asymmetry, in the presence of misvaluation, provides a consistent picture of the value effects under each components of misvaluation.

window, is 1.062% higher than the average returns generated by their overvalued counterparts; the difference is at a significant level of 1%.

The valuation effects of firm misvaluation conditional on both payment mechanism and transaction financing are further presented in the last four columns of Table 3.5. Cash bids generate an average announcement return of 1.537% to undervalued bidders and an average announcement return of 0.495% to overvalued bidders. The difference in bidders' gains between the overvalued and the undervalued groups is more evident for non-equity financed cash deals, where the returns to undervalued bidders are 1.174% higher than overvalued bidders' gains. However, with regard to equity deals and equity financed cash deals, overvalued acquirers do not significantly underperform compared to undervalued acquirers.

These value effects of firm specific overvaluation, conditional on payment financing methods, are in line with the predications of information asymmetry hypothesis. Takeover announcements disseminate firm information to the market and hence reduce the information asymmetry surrounding bidding firms. Investors are then attracted to the newly released information and further reappraise acquiring firms with the arrival of new information (Draper and Paudyal, 2008). The direction of this revaluation depends on the true potential of the firms and the signals sent out by their takeover announcements. If a firm has true potential, releasing good news can bid up its share price via revaluation. On the other hand, bad news released can rarely drive up its share price through revaluation. Cash payments, especially non-equity financed cash payments, are, in general, interpreted by investors as a positive signal; while investors tend to extract negative information contents from equity transactions and

equity financed cash deals. Accordingly, an upward revaluation effect can only be applied to cash deals, in particular non-equity financed cash deals, which are perceived as good news by investors.

Therefore, given the differing information content that can possibly be signalled by different payment financing methods, revaluation effects should lead bidders' gains in different directions. More specifically, as predicated by Hypotheses (3) and (4), for non-equity financed cash deals, undervalued bidders outperform their overvalued counterparts. However, this outperformance is not exhibited by share deals and equity financed cash deals.

#### 3.4.4. Cross-sectional Regression Analysis

The reported univariate test results on the valuation effects of misvaluation (Hypothesis (2), (3) and (4)) are then re-examined with cross-sectional regression analysis. This analysis is based on estimating the following regression equation:

$$R_i - R_m = \alpha + \beta_1 V_i + \beta_2 X_i + \beta_3 \text{ControlVariable}_i + \varepsilon_i \quad (3.7)$$

In equation (3.6), the regressand is the bidders' 5-day accumulative abnormal returns based on a market-adjusted model. Constant  $\alpha$  captures everything after the effects of all independent variables have been accounted for. The vector of explanatory variable  $V$  includes three misvaluation components, namely Firm Misvaluation, Industry Valuation and Market Valuation (undervalued/equilibrium/overvalued bidders=1/2/3, low/neutral/high industry valuation=1/2/3, low/neutral/high market valuation=1/2/3). Interacting terms between payment financing and firm misvaluation (cash deal dummy $\times$ equity flow $\times$ overvalued

bidder, cash deal dummy $\times$ debt flow $\times$ overvalued bidder, cash deal dummy $\times$ cash flow $\times$ overvalued bidder and equity deal dummy $\times$ overvalued bidder) are included in vector X. Control variables are Size, Relative Size, Cross Border Dummy (foreign targets=1), Target Public Status Dummy (unlisted targets=1) and Financial Bidders Dummy (financial bidders=1).

The regression analysis starts with regressing bidders' 5-day announcement returns on individual misvaluation component. As shown in Table 3.6 column 2, the coefficient of the high industry dummy is significantly positive (0.002). However, once the announcement returns are regressed on all components of misvaluation, Industry Valuation loses its explanatory power (model (4)). This can be attributed to the high correlation between these three misvaluation components, where the Pearson correlation coefficient between market valuation and industry valuation is 0.395.<sup>37</sup>

The results from examining the estimated coefficients of Market and Industry Valuation show that high industry valuation significantly drives up bidders' gains.<sup>38</sup> These results further support Hypothesis (2) and are in line with the predictions of information asymmetry hypothesis. Investors evaluate the synergies of the combined entities based on available information. Their estimation errors are closely related to market or industry valuation. More specifically, given that information at a market or

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<sup>37</sup> Low R-squares have been reported in the regression analysis. The low R<sup>2</sup> values indicate that the regression models may not explain the variations of independent variables adequately. However, they do not necessarily suggest that there is no significant relation between the dependent variables and the explanatory variables, as more than one of the regressors have statistically significant coefficients. Such a relationship (i.e., low R-squares corresponding to significant t values) may exist, when a large amount of noise present in the estimation framework.

<sup>38</sup> With regard to market valuation, its estimated coefficient is not significant. As previously mentioned in 3.4.2, the insignificance can be attributed to acquiring firms' exposure to industrial difference. Stock returns of acquiring firms are more sensitive to the valuation condition of the industry which they belong to.



industry level is more accessible and transparent, they naturally allocate more weight to the market- or industry-component of misvaluation during high market or industry periods. The overestimated valuation further gives rise to a hyped synergy-estimation. Since estimated synergies of the resultant unit, together with the revaluation effects of a takeover announcement, determine a bidder's announcement return (Draper and Paudyal, 2008), this hyped synergy-estimation thus leads to a positive stock market reaction to a takeover announcement.

Having examined the value effects of the market- and industry-components of misvaluation, the influence of the firm-specific misvaluation on bidders' gains is then examined. The relevant results are outlined in the paragraphs below.

Table 3.6 column 1 reports that a 0.006 decrease in firm misvaluation causes a unit increase in bidders' announcement returns. However, once the effects are analyzed based on subsamples, partitioned by different payment financing methods, different results are presented. The last 4 columns of Table 3.6 indicate that firm misvaluation shapes takeover performance in a dissimilar manner, which is conditional on a transaction's payment method and financing source. More specifically, the coefficient of the interacting term presenting overvalued bidders with equity financed cash deals is insignificant, as is the coefficient of the interacting term presenting overvalued bidders with share deals. These insignificant coefficients indicate that firm misvaluation has no effect on bidders' gains when equity financed cash deals or share deals are announced; while the coefficient of the interacting term presenting overvalued bidders with debt financed cash deals is significantly negative at -0.031. This significant negative coefficient indicates that undervaluation has the

potential of driving up bidder's returns when non-equity financed cash deals are announced.<sup>39</sup>

These reported misvaluation effects conditional on payment financing methods lend support to the rationale underlying the study of Dong *et al.* (2006) and Draper and Paudyal (2008). Takeovers, similar to any other corporate events, release firm information to the market around the announcement periods. This newly released firm information attracts investors' attention. They then reevaluate the firm and its stock with the arrival of new information. If the firm has potential and is previously undervalued, this reappraising process will correct the prior misvaluation. Moreover, the direction of this correction depends on the contents of information disseminated. Releasing good news will boost the share price through this revaluation. However, this driving up force, of revaluation, can rarely be said to apply to announcements of bad news. Cash payments, especially non-equity financed cash payments, are in general interpreted by investors as a positive signal; while investors tend to extract negative information contents from equity financed cash deals. Therefore, given the different information contents that can possibly be signalled by different payment financing methods, revaluation effects should lead bidders' gains in different directions.

### 3.5 Conclusions

Misvaluation has been recognized as a factor that shapes the US takeover market (e.g., Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Dong *et al.*,

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<sup>39</sup> The estimated coefficient of the interacting term presenting overvalued bidders with internal cash financed cash deals is not significant. This insignificance can be attributed to the revaluation effect being offset by the negative value effects of cash-richness. Harford (1999) documents that cash-richness is inversely related with bidders' announcement abnormal returns.

2006). This study provides evidence that misvaluation as a driving force is not exclusive to US mergers and acquisitions activities. Instead, it appears to be a more generalized effect which crosses international borders. For example, during the period of 1989-2006, the UK witnessed a comovement of merger activities with market valuation. In particular, as shown by the univariate test on takeover frequency, the UK takeover market is more active during high market- or industry- valuation periods.

Moreover, acquisitions driven by this high industry valuation, in general, generate higher short-run stock returns to UK bidders compared with the transactions announced during the periods when the industry valuation is low. However, bidders of high market acquisitions, in general, do not capture significantly higher gains than those of low industry acquisitions. This can be attributed to the industrial difference which acquiring firms are exposed to. Stock returns of acquiring firms are more sensitive to the valuation condition of the industry to which they belong, compared with the aggregate market valuation. In addition to the market- and industry-component of misvaluation, bidders' gains are closely related to their firm-specific misvaluation. Undervalued bidders, in general, outperform their overvalued counterparts.

These effects of firm misvaluation on takeovers are conditional on payment financing methods. More specifically, undervaluation, at a firm-specific level, does not have significant positive effects on either share deals or equity financed cash deals. However, undervalued acquirers outperform overvalued acquirers when non-equity financed cash deals are announced.

These findings, regarding the intensity and the performance of UK takeovers, are in line with the theoretical predictions of the information asymmetry hypothesis. Specifically, based on available information, investors evaluate bidding firms and the synergies of the combined units. Even if they can successfully recognize the misvaluation associated with a bidder, they can seldom value each component of this misvaluation correctly due to their limited access to information. In particular, they naturally allocate more weight to the industry component of misvaluation during high industry valuation periods, as information at an industrial level is more transparent and accessible (Rhodes-Kropf and Viswanathan, 2004). This biased industry valuation impedes investors' synergy-estimations and further gives rise to a hyped synergy-estimation. Since estimated synergies of the resultant firm, as well as revaluation effects of a takeover announcement, determine a bidder's announcement return (Draper and Paudyal, 2008), this overestimated synergy thus can lead to a positive stock market reaction to a takeover announcement.

Meanwhile, in the presence of information asymmetry between bidding firms and investors, mergers and acquisitions release firm information to the market and consequently attract investors to reappraise the bidders' value and growth opportunities (Paudyal and Draper, 2008). The direction of this revaluation depends on the true potential of the bidders and the signals sent out by their takeover announcements. If an acquirer is previously undervalued but has true potential, releasing good news can bid up its share price via revaluations. On the other hand, bad news released has little effect in driving up its share price through revaluations. Cash payments, especially non-equity financed cash payments, are in general interpreted by investors as a positive signal; investors tend to extract negative information contents

from equity transactions and equity financed cash deals. Therefore, given the different information contents that can possibly be signalled by differing payment financing methods, revaluation effects should lead bidders' gains in different directions.

The reported empirical evidence, together with the related theoretical implications, contribute to the ongoing debate on the rationale underlying misvaluation effects which is presented with mixed and ambiguous results. Although the significant positive relation between market valuation and bidders' gains around the announcement period can be explained by managerial herding (e.g., Bouwman *et al.*, 2006) or investment sentiments (e.g., Tebourbi, 2005; Rosen, 2006), both fail to rationalize merger performance when the misvaluation is at a firm-specific level. Instead, information asymmetry, as discussed above, provides a coherent description of this issue which covers the effects of each component (firm, industry and market) of misvaluation.

The empirical findings of this study can facilitate acquirers, especially cash bidders, in coordinating their financing and investment decisions. The reported results show that a hybrid of a transaction's payment method and its financing sources influences bidders' gains. Since mergers and acquisitions are among some of the main investment decisions made by corporate organizations, this documented relevance of payment financing to the value effects of takeovers highlights the interdependence of investment and financing decisions. Such interdependence suggests that the value creation of a firm not only depends on the pattern of resource allocation but also relies on how to finance the resource allocation. Therefore, in enhancing firms' values, the need for a closer integration between the strategic planning and the financial function

of raising funds is required. From the perspective of cash bidders, and given the negative market responses, that follow equity financed cash deals, funds from other sources, for example debt or cash, are presented as better transaction financing choices so long as they have a sufficient cash reserve or debt capability.

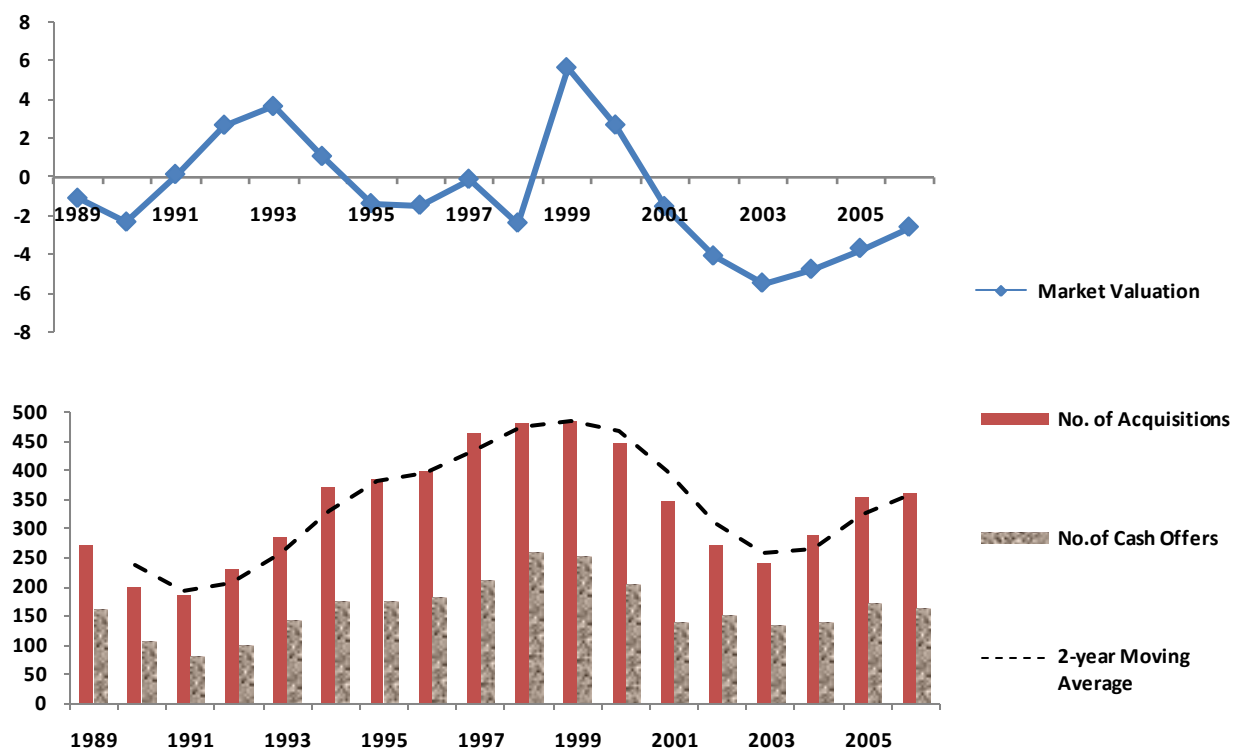
Following on from this conclusion, regarding the stock market reactions to takeover announcements in the presence of misvaluation, the valuation effects of other factors inherent in these reactions also require addressing. Specifically, fluctuations in the stock market have been addressed as a factor which could explain the variations in takeover gains. High market/industry valuation months, in general, experience high takeover gains. These stock market cycles have been rationalized with investor sentiment in behavioural finance literature (e.g., Brown and Cliff, 2005). Therefore, this reveals the possibility of explaining takeover gains with investor sentiment.

Moreover, this potential relationship between takeover gains and investor sentiment, together with the reported relationship between information contents (i.e., information signalled by payment financing methods of takeovers) and takeover announcement returns, form two indispensable elements along the firm information dissemination process. More specifically, in the presence of misvaluation, the market reaction to the arrival of new information around a takeover announcement period is presented in this chapter. As suggested by the empirical findings, this market reaction reflects the firm information signalled by the takeover announcement, in particular the payment financing methods of the takeover. In addition to this information signalled, the market reaction should also include the effects of investors' behaviour acting upon the information released. Accordingly, systematic patterns in the announcement-period

abnormal returns, reflecting investors' behaviour in interpreting the newly-released information, will be examined in the next chapter.

**Figure 3.1. Tendency of Takeover Activity and Market Valuation**

This graph illustrates acquisition activity and market valuation during the 1989-2006 sample period. Monthly FTSE ALL share PE ratios are detrended by removing the best-straight-line from the time series. A detrended PE ratio is then compared with its past 5-year average value, the difference of which is used as a proxy of market valuation in that month. The means of these monthly market valuations are plotted on an annual basis. The number of all acquisitions and cash deals is demonstrated by the bar chart on an annual basis respectively.





**Table 3.1. Value Effect of Misvaluation**

This table summarizes the documented effects of misvaluation components on bidders' performances. The '-' symbolizes the negative linkage between these two factors, while '+' represents a positive correlation. The theoretical explanations underlying these empirical findings are given in the last column.

	<i>Misvaluation</i>	<i>Announcement Return</i>	<i>Long-run Return</i>	<i>Long-run Performance</i>	<i>Causes of value effects</i>
<b>Dong <i>et al.</i> (2006)</b>	Firm-specific	-	/	/	Overpayment & Information asymmetry
<b>Draper and Paudyal (2007)</b>	Firm-specific	-	/	/	Information asymmetry
<b>Ang and Cheng (2006)</b>	Firm-specific	+	+	/	Synergies & Earning growth
<b>Rhodes-Kropf and Viswanathan (2004)</b>	Market level	+	/	/	Mis-estimated Synergy
<b>Tebourbi (2005)</b>	Market-level	+			Investor sentiment
<b>Bouwman <i>et al.</i> (2006)</b>	Market-level	+	-	-	Managerial herding
<b>Rosen (2006)</b>	Market-level	+	-	/	Investor sentiment

**Table 3.2. Sample Descriptions**

The descriptive statistics in this table are based on the sample of 6,086 acquisitions. Acquisitions announced during the period of 1989-2006 are included in this sample, if the bidder is a UK firm listed in LSE, AIM, USM or London Tech with more than £1 mil market value and with sufficient DataStream data. Moreover, the deal value is also required to be over £1 mil. The deal category-equity issue financed cash deals refers to cash deals with new equity issues, held in SDC New Issue Database, 1 year prior to the announcement dates. Both the transaction value and MV of bidders are presented in £mil. CAR (-2, 2) is the 5-day window abnormal returns to bidders and is presented in %. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Deal Categories</i>	<i>Number</i>	<i>Transaction Value</i>	<i>MV of Bidder</i>	<i>CAR(-2,2)</i>
<b>ALL</b>	6086	105.371	1581.124	1.091***
<b>Cash deals</b>	2936	62.596	2284.13	0.962***
<b>Share deals</b>	374	374.883	1136.035	0.817*
<b>Mixed offers</b>	2776	114.285	897.817	1.263***
<b>Equity Issue Financed Offers</b>	786	162.423	2052.482	0.535**
<b>Non-equity financed Offers</b>	5300	96.908	1511.207	1.173***
<b>Unlisted targets</b>	5245	41.532	1248.628	1.308***
<b>Listed targets</b>	841	503.432	3654.379	-0.266
<b>Foreign targets</b>	2234	140.103	2810.326	1.052***
<b>Domestic targets</b>	3851	85.222	868.052	1.113***
<b>Financial bidders</b>	657	336.482	4026.89	0.763***
<b>Non-financial bidders</b>	5429	77.445	1285.596	1.130***

**Table 3.3. Tendency of Takeover Activity and Misvaluation**

This table shows acquisition activity and misvaluation during the 1989-2006 sample period. The total number of mergers and acquisitions, conditional on transactions' payment methods and financing sources, are presented on an annual basis. The deal category-equity issue financed cash deals refers to cash deals with new equity issues, held in SDC New Issue Database, 1 year prior to the announcement dates. Firm misvaluation is measured as:

$$\text{Firm Misvaluation} = (PB_{it} - PB_{jt}) / PB_{jt} \quad (3.1)$$

where *i* stands for stock *i* and *j* stands for the industry *j* to which *i* belongs, in the month prior to the announcement date. The mean of bidders' misvaluation are presented on an annual basis. Monthly FTSE ALL share PE ratios are detrended by removing the best-straight-line from the time series. A detrended PE ratio is then compared with its past 5-year average value, the difference of which is used as a proxy of market valuation in that month. The mean of these monthly market valuations are presented on an annual basis.

	<i>All</i>	<i>Cash deals</i>	<i>Share deals</i>	<i>Mixed Offers</i>	<i>Equity</i>		<i>Firm Misvaluation</i>	<i>Market Valuation</i>
					<i>Issue Financed Offers</i>	<i>Non-equity financed Offers</i>		
<b>1989</b>	274	161	16	97	20	254	1.02	-1.1
<b>1990</b>	200	106	12	82	0	200	0.52	-2.33
<b>1991</b>	185	80	25	80	1	184	0.35	0.13
<b>1992</b>	230	98	25	107	3	227	0.30	2.67
<b>1993</b>	286	142	15	129	4	282	0.44	3.64
<b>1994</b>	374	174	32	168	11	363	1.62	1.06
<b>1995</b>	387	175	33	179	70	317	0.60	-1.38
<b>1996</b>	400	182	30	188	63	337	0.39	-1.46
<b>1997</b>	467	211	32	224	78	389	0.34	-0.12
<b>1998</b>	482	258	27	197	60	422	0.59	-2.38
<b>1999</b>	486	252	20	214	40	446	0.22	5.64
<b>2000</b>	448	203	32	213	62	386	0.28	2.68
<b>2001</b>	348	139	16	193	97	251	0.20	-1.53
<b>2002</b>	271	151	9	111	65	206	0.01	-4.08
<b>2003</b>	241	133	9	99	42	199	-0.01	-5.48
<b>2004</b>	290	139	10	141	49	241	0.38	-4.77
<b>2005</b>	354	171	19	164	72	282	-0.40	-3.69
<b>2006</b>	363	162	12	189	49	314	0.06	-2.59
<b>Total</b>	6086	2937	374	2775	786	5300	0.38	-0.84

**Table 3.4. Takeover Frequency and Misvaluation**

This table shows the frequency of takeover activities, conditional on transactions' payment methods and financing sources, during high and low market/Industry valuation periods. Using monthly FTSE All share/industry PE ratio, each month during the sample period is classified as a high-, low- or neutral-market/industry valuation month by comparing the detrended PE ratio of a month with its past 5-year average. If the detrended PE ratio of that month falls into to the top (bottom) half of the 'above (below) the past 5-year average' group, it is classified as a high (low) valuation month. The numbers of these high- (low-) valuation market/industry months during the sample period are presented in Panel A. The deal frequency listed in Panel B is calculated as the number of deals announced during one particular valuation period divided by the total months of that valuation period. The number of takeover activities, conditional on deal categories and misvaluation, is shown in parenthesis in Panel B.

<i>Panel A: No. of Valuation Months</i>					
		<i>Market Valuation Classification</i>		<i>Industry Valuation Classification</i>	
		<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>
<b>No.</b>		41	72	433	681

<i>Panel B: No. of Acquisitions per Valuation Month</i>					
		<i>Market Valuation Classification</i>		<i>Industry Valuation Classification</i>	
		<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>
<b>All</b>	<b>Frequency</b>	41.37	18.69	3.19	1.99
	<b>N</b>	(1346)	(1696)	(1381)	(1352)
<b>100% Share deals</b>	<b>Frequency</b>	2.02	1.00	0.22	0.10
	<b>N</b>	(83)	(72)	(97)	(68)
<b>100% Cash deals</b>	<b>Frequency</b>	16.22	11.78	1.48	1.04
	<b>N</b>	(665)	(848)	(641)	(705)
<b>Cash deals without pre-acquisition equity issue</b>	<b>Frequency</b>	14.95	10.17	1.37	0.91
	<b>N</b>	(613)	(732)	(594)	(619)
<b>Cash deals with pre-acquisition equity issue</b>	<b>Frequency</b>	1.27	1.61	0.11	0.13
	<b>N</b>	(52)	(116)	(47)	(86)

**Table 3.5. Method of Payment, Financing Sources and Misvaluation**

This table provides bidders' 5-day cumulative abnormal returns (CARs) conditional on deal categories and misvaluation. Using monthly FTSE All share/industry PE ratio, each month during the sample period is classified as a high-, low- or neutral- market/industry valuation month by comparing the detrended PE ratio of a month with its past 5-year average. If the detrended PE ratio of that month falls into to the top (bottom) half of the 'above (below) the past 5-year average' group, it is classified as a high (low) valuation month. The rest are classified as neutral valuation months. HML is the difference in CARs between the high and the low valuation groups. Firm misvaluation is measured as:

$$\text{Firm Misvaluation} = (PB_{it} - PB_{jt}) / PB_{jt} \quad (3.1)$$

where *i* stands for stock *i* and *j* stands for the industry *j* to which *i* belongs, in the month prior to the announcement date. Using this firm misvaluation proxy, an acquirer is classified as an overvalued (undervalued) firm, if its misvaluation proxy belongs to the top (bottom) half of the 'positive (negative) misvaluation' group. CARs for all acquirers are calculated over the 5-day (-2, 2) window, where day 0 is the announcement date. They are presented in %. No. of observations is provided in parenthesis and the t-statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Valuation Groups</i>		<i>All</i>	<i>100% Share deals</i>	<i>100% Cash deals</i>	<i>Cash deals with pre-acquisition equity issue</i>	<i>Cash deals without pre-acquisition equity issue</i>
<b>Panel A: All</b>						
	<b>Mean</b>	1.091***	0.817*	0.962***	0.422	1.028***
	<b>t-value</b>	12.49	1.66	9.06	1.35	9.11
	<b>N</b>	(6086)	(374)	(2936)	(316)	(2620)
<b>Panel B: Market Valuation</b>						
<b>High</b>	<b>Mean</b>	1.766***	0.862	1.741***	0.138	1.877***
	<b>t-value</b>	7.45	0.76	5.89	0.18	5.99
	<b>N</b>	(1346)	(83)	(665)	(52)	(613)
<b>Neutral</b>	<b>Mean</b>	0.651***	0.315	0.582***	-0.013	0.651***
	<b>t-value</b>	6.16	0.63	4.35	-0.03	4.63
	<b>N</b>	(3043)	(219)	(1422)	(148)	(1274)
<b>Low</b>	<b>Mean</b>	1.343***	2.289	0.989**	1.105**	0.970**
	<b>t-value</b>	8.27	1.44	5.66	1.99	5.32
	<b>N</b>	(1696)	(72)	(848)	(116)	(732)
<b>HML</b>	<b>Mean</b>	0.423	-1.427	0.752**	-0.967	0.907***
	<b>t-value</b>	1.47	-0.73	2.19	-0.99	2.50
<b>Panel C: Industry Valuation</b>						
<b>High</b>	<b>Mean</b>	1.225***	1.348	1.177***	-0.470	1.307***
	<b>t-value</b>	6.15	1.04	5.13	-0.57	5.49
	<b>N</b>	(1381)	(97)	(641)	(47)	(594)
<b>Neutral</b>	<b>Mean</b>	1.205***	0.666	1.078***	0.355	1.172***
	<b>t-value</b>	10.56	1.25	7.50	0.98	7.54
	<b>N</b>	(3353)	(209)	(1590)	(183)	(1407)
<b>Low</b>	<b>Mean</b>	0.668***	0.521	0.507**	1.052	0.432*
	<b>t-value</b>	3.69	0.47	2.34	1.45	1.92
	<b>N</b>	(1352)	(68)	(705)	(86)	(619)

**Table 3.5 continued**

<b>HML</b>	<b>Mean</b>	0.557**	0.827	0.670**	-1.522	0.875***
	<b>t-value</b>	2.07	0.48	2.12	-1.31	2.67
<b><i>Panel D: Firm Valuation</i></b>						
<b>High</b>	<b>Mean</b>	0.613***	-0.333	0.495**	0.384	0.514**
	<b>t-value</b>	3.83	-0.46	2.28	0.91	2.11
	<b>N</b>	(1291)	(91)	(574)	(82)	(492)
<b>Neutral</b>	<b>Mean</b>	0.956***	0.881	0.815***	0.616	0.837***
	<b>t-value</b>	8.21	1.41	5.54	1.18	5.48
	<b>N</b>	(3043)	(171)	(1508)	(153)	(1355)
<b>Low</b>	<b>Mean</b>	1.675***	1.653	1.537***	0.095	1.688***
	<b>t-value</b>	8.73	1.38	7.31	0.16	7.56
	<b>N</b>	(1752)	(112)	(854)	(81)	(773)
<b>HML</b>	<b>Mean</b>	-1.062***	-1.986	-1.042***	0.289	-1.174***
	<b>t-value</b>	-4.25	-1.42	-3.45	0.4	-3.55

**Table 3.6. Misvaluation and Bidders' Gain**

This table provides the results of a cross-sectional regression analysis based on the regression equation:

$$R_i - R_m = \alpha + \beta_1 V_i + \beta_2 X_i + \beta_3 \text{ControlVariable}_i + \varepsilon_i \quad (3.7)$$

where the regressor is a bidder's 5-day accumulative abnormal return. The vector of explanatory variable V includes three misvaluation components, namely Firm Misvaluation, Industry Valuation and Market Valuation (undervalued/equilibrium/overvalued bidders=1/2/3, low/neutral/high industry valuation=1/2/3, low/neutral/high market valuation=1/2/3). Interacting terms between payment financing and firm misvaluation (cash deal dummy  $\times$  equity flow  $\times$  overvalued bidder, cash deal dummy  $\times$  debt flow  $\times$  overvalued bidder, cash deal dummy  $\times$  cash flow  $\times$  overvalued bidder and equity payment  $\times$  overvalued bidder) are included in vector X. Control variables are Size, Relative Size, Cross Border Dummy (foreign targets=1), Target Public Status Dummy (unlisted targets=1) and Financial Bidders Dummy (financial bidders=1). T statistics are provided in parenthesis. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Variable</i>	<i>Model</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Constant</b>	0.008*** 2.46	-0.007* -1.83	-0.006 -1.56	0.002 0.50	-0.001 -0.54	-0.002 -0.71	-0.002 -0.67	-0.002 -0.70
<b>Firm Misvaluation</b>	-0.006*** -4.43			-0.006*** -4.41				
<b>Industry Valuation</b>		0.002* 1.85		0.002 1.24				
<b>Market Valuation</b>			0.002 1.50	0.001 0.92				
<b>Equity Deal dummy <math>\times</math> Overvalued Bidder</b>					-0.012 -1.63			
<b>Equity Flow <math>\times</math> Cash Deal dummy <math>\times</math> Overvalued Bidder</b>						-0.013 -0.98		
<b>Debt Flow <math>\times</math> Cash Deal dummy <math>\times</math> Overvalued Bidder</b>							-0.031** -2.20	

Table 3.6 continued

<b>Cash Flow×Cash Deal dummy×Overvalued Bidder</b>								-0.012 <i>-0.49</i>
<b>Size</b>	-1.32E-07 <i>-0.99</i>	-1.56E-07 <i>-1.17</i>	-1.48E-07 <i>-1.11</i>	-1.22E-07 <i>-0.91</i>	-1.65E-07 <i>-1.23</i>	-1.61E-07 <i>-1.20</i>	-1.57E-07 <i>-1.17</i>	-1.60E-07 <i>-1.20</i>
<b>Relative Size</b>	4.53E-04 <i>0.96</i>	0.001 <i>1.11</i>	0.001 <i>1.11</i>	4.80E-04 <i>1.02</i>	0.001 <i>1.07</i>	0.001 <i>1.07</i>	4.96E-04 <i>1.05</i>	0.001 <i>1.07</i>
<b>Target Public Status Dummy</b>	0.016*** <i>6.11</i>	0.015*** <i>5.98</i>	0.016*** <i>5.98</i>	0.016*** <i>6.11</i>	0.015*** <i>5.92</i>	0.015*** <i>6.05</i>	0.016*** <i>6.08</i>	0.015*** <i>6.03</i>
<b>Cross-Border Dummy</b>	2.99E-04 <i>0.16</i>	-3.46E-04 <i>-0.19</i>	-0.001 <i>-0.19</i>	3.63E-04 <i>0.20</i>	-0.001 <i>-0.32</i>	-4.60E-04 <i>-0.25</i>	-3.57E-04 <i>-0.19</i>	-0.001 <i>-0.27</i>
<b>Financial Bidders Dummy</b>	-0.002 <i>-0.84</i>	-0.002 <i>-0.60</i>	-0.002 <i>-0.60</i>	-0.002 <i>-0.76</i>	-0.002 <i>-0.67</i>	-0.002 <i>-0.73</i>	-0.002 <i>-0.75</i>	-0.002 <i>-0.74</i>
<b>Adj R-Squared (%)</b>	0.92	0.65	0.63	0.95	0.64	0.61	0.68	0.60
<b>F</b>	10.38***	7.66***	7.46***	8.28***	7.53***	7.24***	7.89***	7.12***
<b>N</b>	6086	6086	6086	6086	6086	6086	6086	6086



## **Chapter 4:**

# **Investor Sentiment, Targets' Gains and Takeover Premium**

## 4.1 Introduction

*“Appearances to the mind are of four kinds. Things either are what they appear to be; or they neither are, nor appear to be; or they are and do not appear to be; or they are not, and yet appear to be. Rightly to aim in all these cases is the wise man’s task.”*

— Epictetus.

In an inefficient financial market, not every participant can be regarded as a “wise man”. Investors can mis-perceive “appearances” (market information), and tend to interpret information in a sentiment-influenced manner, rather than a rational-analytic one.

Stock market reactions to the arrival of new information around takeover announcement periods have been reported in the previous chapter. Given the potential effects the recipients of this information may have on the manner and the outcomes of information processing, these market reactions should not only incorporate the message itself, but should also include the effects of investors’ behaviour acting upon the released information. Moreover, the previous chapter has also addressed the importance of market/industry valuation in explaining takeover gains. The stock market valuation, especially fluctuations in the stock market, has been attributed to investor sentiment by behavioural finance scholars (e.g., Brown and Cliff, 2005). Therefore, the value effects of mergers and acquisitions are expected to reflect investor sentiment towards the transactions and the firms involved.

The sentiment of noise traders which can persist in the financial market was reported several decades ago (e.g., Shiller, 1981). Furthermore, it has been recognized that sentiment can drive asset prices away from their intrinsic values (e.g., DeLong *et al.*, 1991). Developed upon this, financial scholars have entered into on-going research concerning how best to quantify the link between investor sentiment and asset valuation. Abundant sentiment related explanations have been given to rationalize the cycles of the stock market (Brown and Cliff, 2005) and the fluctuations of transaction volume in the Initial Public Offering (IPO) market (Helwege and Liang, 2004). In both cases a positive relation between sentiment and market activity has been documented.

However, most of the existing research exclusively focuses on sentiment at an aggregate market level. Until recently, the cross-sectional difference in the role of sentiment (sentiment at firm specific level) has not been recognized. Research into the sensitivity of individual stock to shifts in investor sentiment shows that firms, which are more difficult to value and harder to arbitrage, are more vulnerable to the valuation effects of investor sentiment. These firms often possess strong speculative characteristics, which are presented by young age, small size, extreme growth and high return volatility (e.g., Shleifer and Vishny, 1997; Qiu and Welch, 2006; Baker and Wurgler, 2006 & 2007).

Although the understanding of investor sentiment, at both an aggregate market and a firm-specific level, has been accumulating on over time, few researchers have directly or indirectly applied it in the context of mergers and acquisitions. Rosen (2006) claims that market-wide investor sentiment affects aggregate merger

momentum. However, a great deficiency of his study is that investor sentiment is regarded as a factor implicated in the announcement returns generated by recent mergers, rather than being measured with a proxy.

A recent development upon this issue is made by Zhu *et al.* (2008), who quantify this investor sentiment by using the Baker and Wurgler (2006) sentiment index. They report a significant relationship between begin-of-period sentiment and takeover premium. Nevertheless, this finding fails to provide a thorough understanding of the relevance of investor sentiment to mergers and acquisitions. More specifically, the investor sentiment concerned in their research is measured at a general market level. This aggregate market level measurement assumes that investor sentiment towards a stock or firm can equally be applied to other stocks or firms. However, mergers and acquisitions, as an individual corporate activity, can cause cross-sectional differences in investor sentiment and thus are more likely to be exposed to a firm-specific sentiment.

The inadequate research on this issue, as discussed above, reveals several research areas which have not been fully accounted for; such as how to quantify investor sentiment in the takeover market and how to examine the value effects of this sentiment at both an aggregate market and a firm-specific level. Filling these literature gaps forms one of the research incentives of this chapter, which is achieved by examining the first research question, *'how does investor sentiment influence the way in which the stock market interprets and responds to takeover announcements'*.

If the sentiment-laden reaction of investors towards takeover announcements is

reflected by target firms' short-run stock returns, given that target firms' stock returns influence bidders' premium estimations, then there is the potential of investor sentiment bearing upon takeover premium. In terms of takeover premium, managerialism hypothesis (Berkovitch and Narayanan, 1993), hubris hypothesis (Roll, 1986; Varaiya, 1988; Hayward and Hambrick 1997) and synergy pursuing (Gaughan, 2002) have attempted to theorize the premium determination process.<sup>40</sup> Accordingly, different theoretical implications have been proposed. For example, under managerialism hypothesis, a manager's high premium estimation is a conscious process, which means managers from bidding firms knowingly overpay in takeovers to maximize their own utility at the expense of their shareholders. On the other hand, if the hubris hypothesis stands, managers only inadvertently overpay for target firms. This unsettled debate among literature gives rise to the second research question, '*do acquirer's managers knowingly overpay in acquiring targets*'. An expected answer to this question stems from the potential mispricing of targets' shares driven by investor sentiment.

Examination of these two research questions can yield new perspectives on several key issues in financial economics. Firstly, it can complement the findings of extant studies on investor sentiment by showing that the relevance of aggregate and cross-sectional sentiment to stock prices extends beyond its original settings, within asset pricing, to the context of mergers and acquisitions. Specifically, investor sentiment can have some bearing on both target firm's gains and takeover premiums.

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<sup>40</sup> For a literature review specific on these hypotheses, see section 2.2.

Secondly, it can update the understanding of how takeover premiums are determined by introducing an investor sentiment factor, rather than relying on traditional explanations regarding acquirer-, target- and transaction-characteristics. This sentiment factor, once proven as a premium determinant, can further the debate surrounding overpayments in takeovers, which questions whether these overpayments are results of managerialism motives.

The reminder of this chapter is organized into five sections: Section 2 provides a comprehensive literature review on investor sentiment and takeover premium, and further presents hypotheses developments. Section 3 contains the sample selection and description, and introduces the methodology of measuring investor sentiment and takeover premiums. Results from both univariate tests and cross-sectional regression analyses are discussed in Section 4. Section 5 concludes the chapter and points out potential contributions to literature.

## **4. 2 Literature Review**

### **4.2.1 Investor Sentiment**

In order to hypothesize the relevance of investor sentiment to targets' gains and takeover premium, existing literature on investor sentiment is reviewed in this section. This review starts with discussing the influence of aggregate investment sentiment on asset pricing. This setting is then extended to a corporate finance, and further to a takeover, context. In addition to the research on aggregate investor sentiment, the

recent developments towards cross-sectional difference in investment sentiment are reviewed in the last subsection. Upon these existing studies, the hypotheses of this research are developed.

#### **4.2.1.1 Investor Sentiment and Asset Pricing**

It has been an on-going debate as to whether the financial market is rational or not. According to market efficiency theory (Fama, 1970), unemotional investors can always keep capital market prices at the rational present value of expected future cash flow, and any asset return volatility simply reflects fluctuations in fundamentals. However, the existence of systematic mispricing, for example the dramatic stock price run-up followed by the financial market collapse in 1929, does not always fit into the theoretical framework suggested by market efficiency theory (DeLong and Shleifer, 1991). Instead, behavioural finance researchers suggest investor sentiment as an irrational exuberance that drives asset prices away from their fundamental values (Shleifer, 1981)

Early studies on investor sentiment can date back to the 1980s, when the potential effects of sentiment on asset valuation were examined (e.g., Shiller, 1981). As summarised by Baker and Wurgler (2007), these pioneering researches “...were largely theoretical testing... the tendency of aggregate returns to mean revert, volatility in aggregate stock index returns that could not be justified by volatility in

fundamentals...or predictability of aggregate returns using simple valuation ratios like the ratio of aggregate dividends to stock market value” (p.133). However, none of these studies quantified the role of sentiment in aggregate stock returns.

Following these original attempts, more behaviour based models were formalized in the 1990s to theorize the source of investors' irrationality. For example, 'biased self-attribution' was raised by Daniel *et al.* (1998), which stated that investors are overconfident about their own abilities and underestimate bad outcomes; 'conservatism' of Barberis *et al.* (1998) indicated that investor are slow to update their beliefs about the regime in the face of new evidence. No matter what behaviour investors show, the general predictions of these behavioural models, based on psychology theory, are similar. Specifically, they predict that a market overvaluation is expected when investor sentiment is high. Consequently, as market prices will eventually revert to their intrinsic values, stock returns following the high sentiment period should be extremely low (e.g., Barberis *et al.*, 1998; Daniel *et al.*, 1998). The assumption underlying these stock return performances, predicted by the behavioural models, is that both rational arbitrageurs, who are sentiment-free, and irrational traders, who are prone to exogenous sentiment, participate in the financial market. Further, the changes in sentiment shown by irrational traders as well as the limits to arbitrage faced by the rational investors lead to asset mispricing (DeLong *et al.*, 1990).



Developed upon these behavioural models, more recent studies have shifted the research focus from 'whether investor sentiment affects stock prices' to 'how to measure investor sentiment and quantify its effects'. Direct investor sentiment measurements are introduced to quantify the influence of sentiment on aggregate stock returns. For example, Brown and Cliff (2005) provide evidence that, when a survey-based sentiment proxy is used (bull-bear spread), market pricing errors are positively related to sentiment, whereas future returns over multiyear horizons are negatively related.

To summarize, literature on asset pricing and behaviour finance has recognized the influence of investor sentiment as an irrational exuberance that drives asset prices away from their fundamental values (e.g., Shleifer, 1981). This influence has further been rationalized by some behaviour based models (e.g., Barberis *et al.*, 1998; Daniel *et al.*, 1998), and has been quantified with developed sentiment measurement (e.g., Brown and Cliff, 2005). These research developments have enabled a comprehensive understanding on the relevance of investor sentiment to stock returns within an asset pricing setting.

#### **4.2.1.2 Investor Sentiment and Corporate Finance including Takeovers**

As discussed above, the market-level stock valuation is under the influence of investor sentiment. If investor sentiment can result in periodic mispricing relative to

fundamentals, here poses the potential for managers to exploit this mispricing in corporate practice. Given this, financial scholars have been investigating the implications of investor sentiment on corporate activities.

Equity issue, in relation to investor sentiment, is one of the most discussed corporate financing activities. Various attempts have been made to quantify the extent to which equity issue activity is explained by prevailing investor sentiment beyond economic fundamentals (e.g., Lowry, 2003; Helwege and Liang, 2004; Derrien and Kecskes, 2007). Given the aforementioned valuation effects of investor sentiment, a firm should be more likely to issue equity when its stock price is driven up by investor optimism. Helwege and Liang (2004) claim that the volatility of the Initial Public Offerings (IPO) volume in the US cannot be explained by technological innovations, suggested by the neoclassical theory, as the former has greater frequency than the latter. Instead, fluctuations of the IPO market are more in line with the variations in investor optimism.

Using Canada market data, Derrien and Kecskes (2007) compare the effects of fundamentals and investor sentiment in explaining the IPO activities within the petroleum industry. Sentiment, measured by MCSI confidence Index, Barker and Wurgler 2006 Index, or TSE Oil and GAS Index, does have certain explanatory power in capturing IPO volume, although this power is lessened once fundamentals are controlled.

In addition to security issues, IPO particularly, dividend policy is also under the influences of investor sentiment. One of the recently documented corporate dividend behaviours is the decline in the percentage of dividend payers (e.g., Baker and Wurgler, 2004a & 2004b; DeAngelo *et al.*, 2004; Fama and French, 2001).<sup>41</sup>

Early explanations, given to these disappearing dividends, focused on changes in firm characteristics which are suggested by traditional corporate finance theory. For example, Fama and French (2001) claim that US firms, driven by new listings, have tended towards the characteristics which distinguish non-dividend payers, including small size, low profitability and high investment opportunity.

However, more recent studies, presented by Baker and Wurgler (2004a), indicate that investor sentiment, rather than company attributes, are more likely to explain the disappearing dividends. More specifically, Baker and Wurgler (2004b) regard investors' demands for dividend-paying stocks as the driving force of a firm's dividend policy. It is hypothesized that companies tend to cater to investors by paying dividends when investors place a premium<sup>42</sup> on stocks with dividends. Similarly, investors' preferences for stocks without dividend payouts are followed by dividend terminations. Their empirical results show that the dividend trend documented by

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<sup>41</sup> A significant drop from 67% to 21% in the percentage of US firms paying dividends from 1978 to 1999 is documented by Fama and French (2001). Following this intriguing study, Baker and Wurgler (2004a), DeAngelo *et al.* (2004) investigate this issue and find a similar dividend pattern shown by US firms. This phenomenon is not exclusive to the US, as the radical transformation in corporate dividend practice is shared by UK and Indian markets (e.g., Benito and Young, 2003; Reddy and Rath, 2005).

<sup>42</sup> Baker and Wurgler (2004b) define the premium as the difference between the logs of the market-to-book ratios for dividend payers and non-payers.

Fama and French (2001) lines up with fluctuations in catering incentives. In turn, the reduction in the percentage of dividend-paying firms can be attributed to catering effects.

The literature, reviewed above, suggests that, after extending the research context from asset pricing to corporate finance, investor sentiment also has some bearing on corporate practices. More specifically, it influences the volume of a firm's equity issue or payout policy. Having discussed the relevance of investor sentiment to the quantity (volume) of corporate activities, the effects of investor sentiment to the quality of corporate activities (corporate announcement returns) are then examined. The paragraphs below contain a review of related literature.

Literature on asset pricing and behaviour finance has recognized and quantified the influence of investor sentiment as an irrational exuberance that drives asset prices away from their fundamental values (e.g., Shleifer, 1981). Since investors tend to trade heavily when corporate news is released, such an irrational exuberance may be presented on an even larger scale around corporate news announcement periods. Accordingly, investor sentiment may have significant effects on corporate announcement returns.

Recent research efforts have been made concerning this issue, in which a significant amount of sentiment-driven mispricing around the arrival of new firm

information has been reported (e.g., Baker and Wurgler, 2006; Mian and Sankaraguruswamy; 2007). Using a relatively comprehensive investor sentiment indicator, constructed with the first principal component analysis, Baker and Wurgler (2006) find that earning announcement effects are in general lower following high sentiment periods. Similarly, concerning earning announcements, stock splits and dividends payouts, Mian and Sankaraguruswamy (2007) suggest that the stock price sensitivity to good news is greater during high sentiment periods.

Despite the recent research development on the relevance of investor sentiment to corporate announcement returns, only a few studies have indirectly applied it in the context of mergers and acquisitions (Coakley and Thomas, 2004; Rosen, 2006).

‘Merger momentum’, as dubbed by Rosen (2006), represents “a correlation between the market reaction to a merger announcement and recent market conditions” (p.989). In this study, the empirical findings on merger momentum are compared with the theoretical implications of the three most commonly discussed theories, including neoclassical theory, managerial motivations and investor sentiment. If investor sentiment, in particular over-optimism, influences the market reaction to merger announcements, then an autocorrelation in the announcement returns to bidding firms is expected. Further, following the announcement returns, there will be a long-run price reversal. The results of this study show that the share prices of US bidders increase more when the recent mergers have positive responses from the market (hot

market). In addition, firms that announce transactions in a hot market have a downward drift in their stock prices in the post-announcement period. These empirical results of short-run positive abnormal returns in a hot market, and their long-run reversals, are in line with the documented relevance of investor sentiment to asset pricing (e.g., Barberis *et al.*, 1998; Daniel *et al.*, 1998).

A similar sentiment driven merger momentum is found in the UK takeover market by Coakley and Thomas (2004), which is used to explain the merger waves from 1985 to 2000. They define a hot market as a calendar month which has more than ten completed acquisitions. In this hot market period, bidders generally captured higher announcement returns compared with cold-market acquisitions. These announcement effects of hot-market acquisitions further reverse in the long-run.

However, a deficiency shared by both of these studies is that the role of investor sentiment is drawn based on an un-quantified sentiment. Specifically, investor sentiment is regarded as a factor implicated either in the announcement returns generated by recent mergers or in the activeness of the takeover market, rather than being directly measured with a proxy. Therefore, there is the potential that the reported merger momentum is actually attributable to factors other than investor sentiment. Given this, quantifying investor sentiment and further examining its role on takeovers become necessary. This research necessity, which is unaccounted for in existing literature, breeds the first hypothesis:

Hypothesis (1): prevailing investor sentiment influences target firms' announcement returns in the same direction as the sentiment.

A recent development upon this issue is made by Zhu *et al.* (2008). They use the Baker and Wurgler (2006) investor sentiment indicator as the proxy for sentiment and examine whether takeover premiums are driven by investor sentiment. Both a prevailing and begin-of-period sentiment is related to each observation. A positive relation between begin-of-period sentiment and takeover premium is reported. They explain these findings through bidding firms being relatively overvalued in the presence of optimistic market sentiment. It is this over-pricing that further pushes up the premium paid by the acquirers. Conversely, when the sentiment is low, bidding firms are relatively underpriced and less premium is required. However, this positive relationship cannot be applied to premium and prevailing sentiment.

Nevertheless, these findings are debatable, as the begin-of-period over-pricing should be followed by price reversals in the succeeding periods (as in Brown and Cliff, 2005; Baker and Wurgler, 2006). Therefore, a negative rather than positive correlation between premium and begin-of-period sentiment should be expected. Motivated by this, here arises the second hypothesis:

Hypothesis (2): Takeover premium is driven by prevailing investor sentiment.

In summary, developed upon the original research attempts towards examining the effects of market-level investor sentiment on asset pricing, more recent literature has identified the relevance of aggregate investor sentiment to corporate financing and investment activities. Further, this relevance has added a behavioural factor to

the takeover literature by suggesting a sentiment-laden takeover premium (Zhu *et al.*, 2008) and a sentiment driven merger momentum (Rosen, 2006). Reviewing these takeover studies reveals literature gaps existing in the announcement effects of takeovers under investor sentiment and the relationship between takeover premium and investor sentiment. Upon these two areas, unaccounted for by existing literature, two hypotheses have developed which will be tested in section 4.4.1.

#### **4.2.1.3 Cross-sectional Variations of Investor Sentiment**

All of the previously discussed literature assumes that investor sentiment has an identical effect across the financial market, which means sentiment-laden investors' reactions to one stock (or company) can be equally applied to another stock (or company). However, counter-views, like those held by Qiu and Welch (2006) and Baker and Wurgler (2006 & 2007), suggest that sentiment may have cross-sectional differences.

Baker and Wurgler (2006) define investor sentiment as 'the propensity to speculate'. Under this definition, high (low) sentiment corresponds to a pushed-up (driven-down) demand for speculative investments. In line with the consumer demand theory of Lancaster (1966), investors are expected to "...demand stocks that have the bundle of salient characteristics that is compatible with their sentiment" (Baker and Wurgler, 2006, p.1649). This means investors, with a higher propensity to speculate,



demand investments with more speculative characteristics. Therefore, the speculativeness of stocks determines which stock is more susceptible to shifts in investor sentiment.

In addition to this variation in sentiment-laden demands across the stock market, a cross-sectional variation in arbitrage also exists. Both idiosyncratic risks and costs associated with arbitrage vary among stocks. More specifically, speculative stocks are more risky (Wurgler and Zhuravskaya, 2002) and costly to trade (Amihud and Mendelsohn, 1986). The limited arbitrage makes it impossible for sentiment-free arbitrageurs to drive back the mispricing of speculative stocks which is caused by irrational traders.

Since both sentiment-laden demand and arbitrage constraints vary among stocks, it is likely that investor sentiment has cross-sectional effects on stock returns. By using investor sentiment to predict the returns of high-minus-low portfolios, which are long on stocks with high speculative characteristics and short on stocks with low speculative characteristics<sup>43</sup>, Baker and Wurgler (2006&2007) report a positive relationship between sentiment and these portfolios returns.

This relevance of cross-sectional variation of investor sentiment to asset pricing has attracted research development towards examining its implications on corporate

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<sup>43</sup> Speculative characteristics are presented by small size, young age, high return volatility, negative profitability, no dividends and extreme growth.

finance.

As there are active investor tradings around corporate announcements, a significant amount of sentiment-driven mispricing may occur with the arrival of new information. Mian and Sankaraguruswamy (2007) investigate the sensitivity of stock price to earnings announcements in the presence of investor sentiment, and further examine variations in this sensitivity. They predict that, during high (low) sentiment periods when speculative demand is high (low), investors are more likely to bid up (down) a firm's share price around a corporate announcement. This prediction is supported by the results that the stock price sensitivity to good news is greater during high sentiment periods. Furthermore, this relation is especially pronounced for small, young, volatile, non-dividend paying or distressed stocks.<sup>44</sup> In line with Baker and Wurgler (2006&2007), these stock attributes characterize speculative stocks. Therefore, this result shows that the driving force of high investor sentiment, which raises a firm's announcement returns, is more pronounced for firms with more speculative socks.

The aforementioned literature, on both asset pricing and corporate finance, recognize the existence of cross-sectional investor sentiment and further quantify its effects on stock returns. Developed upon Hypotheses (1) and (2), this cross-sectional variation in the effects of sentiment further yields the third and the fourth hypotheses:

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<sup>44</sup> In the work of Mian and Sankaraguruswamy (2007), good news is presented by positive unexpected earnings. For instance, an increase in dividends paying and stock splits are perceived as good news.

Hypothesis (3): More speculative targets are more vulnerable to the effects of investor sentiment on announcement returns.

Hypothesis (4): The effects of investor sentiment on takeover premium are more pronounced for more speculative targets.

#### **4.2.2 Takeover Premium**

The research objective of this study is to examine the effects of investor sentiment, in both an aggregate market and a cross-sectional context, on targets' gains and takeover premium. Existing literature in relation to investor sentiment and targets' gains has been discussed in section 4.2.1 and 2.3.3 respectively. In order to enable a better understanding of takeover premium, relevant literature is reviewed in this subsection.

Most mergers and acquisitions literature focuses on the value effects of takeovers. Abundant deal and firm characteristics have been suggested to explain bidders' and targets' gains around and after the announcement period (e.g., size by Moeller *et al.*, 2004a; target ownership by Faccio *et al.* 2006, target domicile by Baldwin and Caves, 1991 and Conn *et al.*, 2005, payment methods by Myers and Majluf, 1984, misvaluation by Shleifer and Vishny, 2003 and Rhodes-Kropf and Viswanathan, 2004). Compared with these widely-researched value effects, fewer research efforts have been made towards examining takeover premium, which is another crucial element of

takeover activity. These studies have suggested several determinants that theorize and rationalize the magnitude of takeover premium and the existence of bidders' overpayment. These explanations largely come from the following three perspectives.

Firstly, factors, in relation to targets' operating and profitability, determine the value creation from an acquisition and hence affect the premium a bidder would likely pay. A bidder's willingness to pay is directly related with the synergies that can be generated via takeovers. Accordingly, transferable economic gains, for example expected improvements in financial and operating efficiency, can breed high takeover premiums (Gaughan, 2002). These transferable economic gains are more likely to be generated in acquiring a target that has growth potential, profitability and strategically fits with the acquirer. Hence, the acquirer would like to offer a high premium in this case.

Secondly, in addition to these target-related factors, several managerial factors from bidders' perspectives may also enter the premium determination process.

The different interests and motives possessed by managers and shareholders can give rise to principal-agent conflicts (e.g., Rozeff, 1982; Easterbrook, 1984; Jensen, 1986). These conflicts exist in the process of determining takeover premium. According to managerialism hypothesis, managers are prone to increase their firm size by acquiring companies so as to meet their personal desires for greater prestige and

public exposure (Berkovitch and Narayanan, 1993). Driven by these managerialism motives, they tend to place a high premium on their target firms (Black, 1989). In doing so, they discount risks and exaggerate potential gains to persuade shareholders to agree with the high premium required.

Offering hyped premium, as suggested by the managerialism hypothesis, is a conscious process. This means managers knowingly overpay in takeovers to maximize their own utility at the expense of their shareholders. However, there is the possibility that managers may inadvertently overpay for target firms, as suggested by hubris hypothesis (Roll, 1986; Varaiya, 1988; Hayward and Hambrick 1997) and the 'winner's curse' (Varaiya and Ferris, 1987).

Hubris can give rise to managerial optimism. As summarised by Hayward and Hambrick (1997), this optimism can come from recent organisational success, media praise for the management, management's self-importance or weak board vigilance. Further, this optimism increases the magnitude of takeover premiums offered by managers from acquiring firms.

Another determinant of high premiums, in relation to the managerial factors, is managers' ignorance of the 'winner's curse'. According to Black (1989), in the auction of an asset with uncertain value, bidders are vulnerable to 'winner's curse'. More specifically, "even if they estimate value accurately on average, they win the

bidding primarily when they overestimate an asset's true value, and thus tend to overpay on average" (p.625).

Thirdly, in addition to the factors discussed above relating to targets' operational conditions and bidders' managerial considerations, competitions around a transaction form the last determinant of takeover premium. If multiple bidders are involved in acquiring a target, then the competition between bidders is prone to bid up the price paid to the target. In order to discourage competitors from entering the control contest, offering a large premium over the target's market value is an effective way to pre-empt competition (Fishman, 1988). In line with this research, Jennings and Mazzeo (1993) provide empirical evidence that a high premium can successfully deter competing offers. This high premium is further associated with a lower likelihood of target management's resistance in accepting the offer.

As discussed above, existing literature has suggested several premium determinants from three perspectives. These identified determinants can further shed light on the post-takeover performances of acquiring firms. Negative long-run stock returns of bidders have been widely documented (e.g., Gregory, 1977; Bradley and Sundaram, 2004; Conn *et al.*, 2005). There is a growing belief that this poor long-run performance of acquirers can be attributed to overpayments. Schwert (2003) suggests that overpayment is perhaps the prime suspect behind the long-run underperformance puzzle. If the managerialism hypothesis (Berkovitch and Narayanan, 1993) stands,

then the premium determination driven by managerialism motives rather than takeover synergies may underlie the negative long-run performance. Even if there were economic gains from takeovers, paying an excessive merger premium can largely cancel these synergies.

However, different results are reported by Antoniou *et al.* (2008). Based on a sample of 396 successful UK public mergers announced from 1985 to 2004, they find that in a 3-year event window following takeover announcements, there is no significant difference in bidders' long-run abnormal returns between high premium paying portfolio and low premium paying portfolio. Meanwhile, short-run cumulative abnormal returns tend out to be positively correlated to the magnitude of premium paid by acquirers. These results suggest that high takeover premiums are unlikely to be responsible for acquirers' poor post-merger performances.

#### 4.2.3 Summary of Hypotheses

A comprehensive examination of extant studies on investor sentiment reveals literature gaps existing in the relevance of investor sentiment to corporate takeovers. These gaps exist in: i) inadequate research on extending the value effects of investor sentiment from its original setting within asset pricing to a new context of mergers and acquisitions, ii) un-quantified investor sentiment in examining its influence on the takeover market, and iii) un-examined individual (firm-specific) differences in the

relation between investor sentiment and takeovers. Given these areas unaccounted for by existing literature, four testable hypotheses, as discussed in previous sections, are developed.

Hypothesis (1): prevailing investor sentiment influences target firms' announcement returns in the same direction as the sentiment.

If this hypothesis stands, managers' decisions of offering premiums are likely to be influenced by this sentiment-driven mispricing. Therefore,

Hypothesis (2): Takeover premium is driven by prevailing investor sentiment.

If a cross-sectional variation in the value effects of investor sentiment exists, the previous two testable hypotheses can be further developed to both,

Hypothesis (3): More speculative targets are more vulnerable to the effects of sentiment on announcement returns.

Hypothesis (4): The effects of investor sentiment on takeover premium are more pronounced for more speculative targets.

### **4.3 Data and Methodology**

#### **4.3.1 Sample Selection**

Mergers and acquisitions data is obtained from the SDC database. There are 59191 UK takeover observations from 1985 to 2007. A minimum size criterion that



deal value is more than £1 mil excludes 28623 transactions. Since takeover premium<sup>45</sup> is one of the major concerns of this study, offer price is obtained from SDC, which further reduces the sample to 3196 observations. Only London listed targets (2060 observations) are then included in the sample.

In order to estimate investor sentiment, Investment trust discount, FTSE monthly turnover, Number of monthly IPO and monthly Consumer Confidence Index are collected from DataStream, SDC and Eurostat respectively to construct a sentiment indicator.<sup>46</sup> In addition, data presenting firms' speculative characteristics, including Base Date, Market value, DPS, EPS, net sales, net property, plant and equipment (PPE) and share price are obtained from DataStream.<sup>47</sup> The availability of this data, on investor sentiment and firm characteristics, condenses the sample period to 1987-2007, and further reduces the sample size to 1278 observations.<sup>48</sup> Control variables for takeover premium, such as targets' free cash flow and leverage ratio, are then included. A final sample consisting of 1148 observations is therefore constructed.

### 4.3.2 Stock Speculative Characteristics

In answering what stocks are more likely to attract sentiment-laden investors,

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<sup>45</sup> Takeover premium is measured 4 weeks prior to the announcement date in this study, which is calculated as in equation (4.2). For motivations underlying this measurement, see section 4.3.6.

<sup>46</sup> For an intensive discussion on the sentiment indicator, see section 4.3.5.

<sup>47</sup> For an intensive discussion on these speculative characteristics, see section 4.3.5.

<sup>48</sup> 1497 observations survived after applying the last criteria regarding data availability; however manual verification based on information hold in Lexis-Nexis excludes 213 bids from the final sample. There are 23 transactions with unverified takeover premium data; 185 transactions are actually share buyback instead of takeovers; 5 deals involve suspended targets, whose shares were suspended before the announcement date.

Baker and Wurgler (2006) suggest that “investors simply demand stocks that have the bundle of salient characteristics that is compatible with their sentiment” (p.1649). They define sentiment as the propensity to speculate. Accordingly, sentiment-laden investors demand speculative stocks.

These speculative stocks are characterized by uncertainties surrounding the firms which these stocks belong to. These uncertainties can be presented by large size, young age, non-profitable earnings, no dividends, low tangibility, high return volatility and high growth (Baker and Wurgler, 2006 & 2007). Similarly, this study measures firm speculative characteristics by firm size, age, profitability, asset tangibility, dividends payout, return volatility and growth opportunity.

Market value of equities is used as a proxy for firm size (SIZE), measured at the calendar year end, prior to a takeover announcement date. Firm age (AGE) is the number of days from a firm's based date to the firm's takeover announcement date. The commonly used financial ratio earning per share (EPS) is employed to measure a firm's profitability. Asset tangibility is measured by a firm's property, plant and equipment. It is then scaled by the firm's total assets to control cross-sectional size differences (PPE/TA). Dividend per share (DPS) is included, since firms paying dividends are associated with less uncertainty. Return volatility (SIGMA) is the standard deviation of the market adjusted residuals of a target's daily stock returns measured during the period (t-205, t-6) where t is the acquisition announcement day.

Growth in sales (GS), which is the change in a firm's net sales divided by the net sales in the prior year, is the proxy for growth opportunity. Apart from SIZE, AGE and SIGMA, the other 4 variables are measured at the fiscal year end, prior to a takeover announcement.

### 4.3.3 Control Variables

Existing theories and hypotheses have suggested several firm and deal characteristics as determinants of takeover premium (as in section 4.2.3). In order to distinguish the effects of investor sentiment on takeover premium from the influences of these factors, several control variables are included. These control variables fall into three groups which represent characteristics of targets, bidders and transactions respectively.<sup>49</sup>

Gondhalekar *et al.* (2004) suggest that targets with high levels of free cash flow are more attractive to bidders due to the large amount of cash that can be subjected to managerial discretion after the transaction. Hence, high premiums are incurred in

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<sup>49</sup> These control variables aim to distinguish the effects of investor sentiment on takeover premium from the influence of other factors. In addition to this, they can also control the effects of suggested determinants of targets' gains (as discussed in section 2.3.3). For example, both payment method and deal attitude have some bearing on targets' announcement period returns. Apart from these seven variables, a proxy for 'takeover anticipation' is included to reflect a recent research development. The notion of 'takeover anticipation' was introduced by Bauguess *et al.* (2007) in explaining targets' abnormal returns. The anticipation hypothesis is based on the principal that stock price adjusts to the degree of the unanticipated fraction of information. When it is applied to the merger and acquisition context, the abnormal returns of bidding firms are expected to be significantly related to the degree of surprise surrounding a bid announcement. A high takeover anticipation gives rise to low target returns. This high level of anticipation is represented by a low level of book-to-market ratio of target firms since it suggests that the market price incorporates expected takeover premium. Following this method, market to book value (MTBV) is included as another control variable.

acquiring these targets. Given this, free cash flow of targets is included as a control variable. It is measured as free cash flow per share (FCF) at the year end, prior to a takeover announcement.

A firm's free cash flow is likely to be encumbered, if the firm is highly leveraged. Thus, the debt capability of a firm needs also to be taken into account. Walkling and Edmister (1985) identify target firms' leverage as one of the takeover premium determinants. Specifically, a high leverage exerts negative influence on premiums. As a general accepted practice, a target's leverage level is measured by its debt-to-equity ratio (DE) at the year end, prior to its takeover announcement, calculated as total debt/common equity.

As reported by Gondhalekar *et al.* (2004), a target's size is inversely related with the magnitude of the premium. They attribute this relation to economic gains from acquiring a small target. As smaller firms are relatively easy to integrate into the acquiring firms' operations, acquirers would likely offer high premiums in this case. However, as suggested by the managerialism hypothesis (Berkovitch and Narayanan, 1993), a positive relation between target size and the magnitude of premium can also be seen. This is because managers from acquiring firms are more likely to gain additional prestige and other non-pecuniary benefits from managing large targets. Driven by these motives, managers are more likely to place a high premium on large target. Consistent with the previously mentioned firm size, as a speculative

characteristics proxy, a target's size is measured by its market value (MV).

In addition to targets' characteristics, factors related to acquiring firms may exert effects on takeover premium. Barger *et al.* (2007) introduce the importance of private bidder transactions. The ownership of privately held firms is often concentrated within a small group. This concentrated ownership can serve as an effective monitor of managerial performance (Draper and Paudyal, 2006). Under this monitoring mechanism, managers from acquiring firms will carefully evaluate their targets and make discreet investment decisions. Thus, they are less likely to overpay their acquired firms. Given this, Listed Bidder is included as a dummy variable, which equals 1 if the bidder is public and 0 otherwise.

Besides attributes of targets and bidders, deal characteristics can also influence the magnitude of the premium paid. Competitions among multiple bidders are likely to bid up the price that the successful bidder must ultimately pay. Concerning the US takeover market, Walkling and Edmister (1985) and Gondhalekar *et al.* (2004) provide supportive empirical evidence to this conjecture. They conclude that takeover premium increases when bidders compete for ownership of a target's assets. Therefore, a dummy variable is included, taking the value of 1 if there are multiple bidders and 0 otherwise.

Other widely documented deal characteristics, including methods of payment and

attitude of transaction, are also included as dummy variables. As reported by Travlos (1987) and Moeller (2005), cash payment significantly increases takeover premiums. This effect can be the result of the tax on capital gains incurred from receiving cash payments. In this case, bidders need to offer high premiums to offset the tax burdens of target firms (Wansley *et al.*, 1983). In addition, as suggested by Moeller (2005), given the existence of takeover defences in hostile offers, high premiums are required to entice target shareholders. Therefore, target firms in hostile deals receive higher premiums, compared with those in friendly transactions (Moeller, 2005; Sudarsanam and Mahate, 2006).

#### 4.3.4 Sample Description

Descriptive statistics of the sample are presented in Table 4.1, where the mean value of key factors, including targets' announcement returns, takeover premium, investor sentiment indicators and targets' speculative characteristics, are summarised conditional on the methods of payment. As shown, the average premium paid by UK bidders in the past couple of decades is 26.465%, which is significantly lower than the 42% and 45% reported by Abhyankar *et al.* (2005) and Antoniou *et al.* (2008) respectively.<sup>50</sup> The difference can be attributed to observations with negative takeover premiums being excluded from their samples.

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<sup>50</sup> The sample of Abhyankar *et al.* (2005) constitute 305 observations during the 1985-2000 period; while a sample of 396 observations from 1985 to 2004 is used in the study of Antoniou *et al.* (2008).

Column 3 of Table 4.1 shows that the average value of targets' announcement returns is 14.9%. Compared with the average gains that bidders can capture from takeovers, the announcement effect is considerably larger for target firms.<sup>51</sup> In addition, the magnitude of targets announcement returns varies across the sample, depending on the mode of payment. More specifically, targets acquired by cash bidders capture higher returns than their counterparts. This can be the result of the high premium (28.873%) received by target firms in cash deals.<sup>52</sup>

Table 4.2 presents annual data on investor sentiment, targets' gains and takeover premium. Column 2 shows that the mean of targets' gains on an annual basis ranges from a minimum of 6.653% in 1994 to a maximum of 22.827% in 1997. Column 3 illustrates that the mean of annual premium varies from a minimum of 9.229% in 1992 to a maximum of 39.032% in 1997. As shown in column 4, movements in investor sentiment exhibit a similar pattern to variations in targets' gains and takeover premium. Targets' gains and takeover premium fluctuate during the sample period, peaking in the late 1990s when investor sentiment is relatively high.

Variations in prevailing sentiment and premium are pictured in Figure 4.1, where these two factors tend to move together. It is evident from the charts that a general recovery (early 1990s)-booming (late 1990s)-decline (2000-2003) cycle is presented

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<sup>51</sup> A similar comparison is reported by Martynova and Renneboog (2006). In their study, bidders' cumulative abnormal returns are 0.39% on average, corresponding to an average value of 15.82% for targets.

<sup>52</sup> As discussed in the last subsection, this effect of cash deals is attributable to the tax, on capital gains, incurred from receiving cash payment. In this case, bidders need to offer high premiums to offset the tax burdens of target firms (Wansley et al., 1983; Moeller, 2005).

in both cases, although some inconsistencies exist. This co-movement, as well as the annual data of investor sentiment and takeover premium reported in Table 4.2, lends preliminary support to Hypothesis (2) that, prevailing investor sentiment drives takeover premium in the same direction as this sentiment.

### 4.3.5 Measurement of Investor Sentiment

Like any key concepts in behavioural finance, a major concern of financial scholars has been identifying an ideal proxy which can exemplify abstract conceptions. The same is the case with regard to investor sentiment. Both survey- and theory-based measurements have been introduced.

Direct survey measures rely less on the financial theory, while seek to identify proxies from direct survey questions. The flexibility in designing questionnaires determines that there is no universal standard in this survey-based measurement. 'Consumer confidence index' is among the most commonly used survey-based measurement. It is built on the assumption that investors are likely to be bullish about the economy when they are bullish about the stock market and vice-versa (DeLong *et al.*, 1990). In addition to this 'consumer confidence index', different survey indexes have been proposed as experimental attempts towards examining investor sentiment, for example 'happiness index', 'UBS/Gallup index of investor optimism' and 'TSE oil&gas index'(e.g., Qiu and Welch, 2006, Derrien and Kecskes, 2007). A common, and probably the biggest, drawback shared by all survey-based proxies is the noise included in these measures due to the human factor involved in conducting surveys.



Theory-based measurements, on the other hand, are free from this noise and are based on investor sentiment theory and financial indicators. Zweig (1973) suggests that mutual fund discount might reflect the expectation of individual investors. Developed upon this, Lee *et al.* (1991) introduce the 'closed end fund discount' as a sentiment proxy. The use of this measurement is based on the assumption that a closed end fund discount is required to attract retail investors. If investor sentiment is low, then a high discount is needed to entice these less-motivated investors. On the other hand, offering such a high discount becomes unnecessary when investors are already highly-motivated. Therefore, a high closed-end fund discount should reflect a low retail investor sentiment. Since it was introduced, this proxy has become one of the most widely used measures for investor sentiment (e.g., Swaminathan, 1996; Neal and Wheatley, 1998). Other proxies have also been suggested, one of which is 'bull-bear spread'. It is a common measurement of sentiment in the financial and business press (Brown and Cliff, 2005). However, the use of these theory-based measures is not indisputable, as they do not correlate well with the survey-based ones, and fail to explain the abnormal returns of small firms (Qiu and Welch, 2006).

As previously mentioned, no matter whether the proxy is directly survey-based or indirectly theory-based, none of them are definitive. Therefore, this deficiency reveals an area for the development of a more comprehensive measurement. Accordingly, Baker and Wurgler (2006) form a composite sentiment indicator, which consists of six common proxies for sentiment, including the closed-end fund discount, NYSE share turnover, the number and the average first-day returns of IPOs, the equity share in new issues, and the dividend premium. This Baker and Wurgler (2006) index extracts the common variation of several suggested sentiment proxies and lines up perfectly with

anecdotal evidence in the US stock market. Since its development, this index has been directly cited and intensively used in subsequent research (e.g., Derrien and Kecskes, 2007; Zhu *et al.*, 2008; Mian and Sankaraguruswamy, 2007).

Following Baker and Wurgler (2006), a monthly sentiment indicator is constructed in this study to directly capture the prevailing sentiment around takeover announcements. Each takeover observation is then associated with a sentiment indicator in that announcement month. This indicator is based on a number of series hypothesized to represent investor sentiment, namely, investment trust discount, FTSE turnover, the number of IPOs and consumer confidence index.<sup>53</sup> The rationale underlying the incorporation of investment trust discount and consumer confidence index has been previously discussed. FTSE turnover is included, as optimistic sentiment shown by investors promotes stock market participation and in turn increases stock market liquidity. Hence, this high sentiment can be represented by a high stock market turnover (Baker and Stein, 2004). In addition, given the sensitiveness of IPO activities to sentiment (Baker and Wurgler, 2006), the number of IPOs is incorporated as another component.

The investment trust discount (ITD) is the monthly weighted average difference between the net asset value of investment trust shares and their market prices. FTSE

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<sup>53</sup> Compared with the sentiment index of Baker and Wurgler (2006), three index components, including IPO first day return, the equity share in new issue and dividend premium, are excluded from the monthly indicator due to data availability. Moreover, consumer confidence index is included as a new component of this indicator. This is because, as discussed above, direct survey-based measurements capture investor sentiment in a different manner and have some advantages over the theory-based proxies.

turnover (TURN) is based on the total number of its constituent shares traded on the exchange. Since turnover presents an upward trend during the sample period, the natural log of the raw trade volume is then detrended by removing the 5-year moving average to generate TURN. Consumer confidence index (CCI) is the difference between the confidence index of a month and the average confidence index over the sample period. Similarly, the number of IPOs (NIPO) is the difference between the IPO volume of a month and the average IPO volume over the sample period

In order to identify patterns in these sentiment measures and express them in such a way which highlights their similarities, principal component analysis is used to reduce data dimensionally with minimum information loss. Following Barker and Wurgler (2006), both current month sentiment proxies and their lags are included in constructing the indicator, as variables may take different time to reflect a given shift in sentiment. Having identified the financial rationale underlying the use of first principle component analysis, these proxies are then tested against the statistical requirements of principal component analysis to examine whether such a analysis is applicable in this case. The test results show that the sampling adequacy is more than 0.50 for all of the 8 variables and the Bartlett test of sphericity is significant. Therefore, the first principal component analysis can be used to construct a sentiment indicator.

A primitive sentiment indicator is obtained by estimating the first principal component of the four proxies and their lags. A correlation analysis is then executed to

extract each proxy's lead or lag, whichever has higher correlation with the primitive sentiment indicator.<sup>54</sup> The sentiment indicator (SENTIMENT) is then calculated as the first principal component of the four selected variables, which is expressed as:

$$SENTIMENT_t = -0.446ITD_{t-1} + 0.064TURN_{t-1} + 0.527NIPO_t + 0.337CCI_{t-1} \quad (4.1)$$

In equation (4.1), each of the components has been standardized to generate an indicator that has unit variance. The first principal component has an eigenvalue of 1.683 and a communality of 42.07%, which means that it explains 42.07% of the sample variance and can present the common patterns of variables well.<sup>55</sup>

Moreover, each individual proxy enters the constructed indicator with the expected sign (with a negative coefficient of -0.446 for investment trust discount and positive coefficients for others).<sup>56</sup> In addition, the lead-lag relationships of these four proxies support the assumption of Baker and Wurgler (2006). They predict that proxies, involving firm supply responses, lag behind proxies based directly on investor demand or investor behavior. This prediction is consistent with the constructed sentiment indicator in which price and investor behavior variables (ITD, TURN, CCI) lead firm supply variables (NIPO).

<sup>54</sup> In estimating the first principal component, all 4 proxies are kept, because the following requirements of keeping variables are satisfied: i) the derived components have communality greater than 0.5; and ii) none of the variables have loadings of 0.4 or higher for more than one component.

<sup>55</sup> An adjusted sentiment indicator is constructed by Baker and Wurgler (2006), which removes business cycle variation from each of the proxies prior to the principal components analysis, in order to distinguish between a common sentiment component and a common business cycle component. However, the results based on this adjusted sentiment indicator show that "orthogonalizing to macro variables is a second-order issue; it does not qualitatively affect any component of the index or the overall index" (p.1658). Therefore, a raw instead of adjusted sentiment indicator is used in this study.

<sup>56</sup> For discussion on the relations between these proxies and investor sentiment, see pp. 127-129.

Table 4.3 summaries the constructed sentiment indicator and its constituents; Figure 4.2 plots the constructed monthly sentiment over the sample period. As shown in Table 4.3, the sentiment indicator is highly correlated to its four constituents, with the prevailing number of IPO per month as the denominating factor in determining monthly sentiment. In addition, consistent with expectations, TURN, NIPO and CCI are positively associated with sentiment levels, and ITD is negatively related. In general, these correlation coefficients show that the constructed indicator through first principle components analysis does not arbitrarily elevate individual proxies. Instead, it extracts the common movements and irons out idiosyncratic variations.

#### **4.3.6 Measurement of Takeover Premium**

Commercial mergers and acquisitions databases, for example SDC, measure acquisition premium as the percentage difference between the offer price per share paid to a target and the target's share price prior to the announcement. This approach is also generally accepted in academic studies (e.g., Varaiya, 1986; Varaiya and Ferris, 1987; Barclay and Warner, 1993; Gondhalekar *et al.*, 2004).

However, a debate has been surrounding this widely accepted practice. As suggested by Nielsen and Melicher (1973), one of the problems in measuring premium is the selection of an appropriate time period in which to measure the merger premium. This selection should aim to choose a time period which is sufficiently far

from a firm's formal announcement date, so that news leaked pre-announcement do not unduly affect the firm's stock price. On the other hand, the time period has to be close enough to the announcement date, so that the firm's market prices can directly reflect the information released.

The time period, which has been used in literature, varies from one week to three months prior to the announcement day. The 1-week premium (e.g., Moeller, 2005), is likely to incorporate the signalling effects of takeover announcements, since Schwert (1996) reports that the price run-up associated with a takeover occurs earlier than 30 days prior to the announcement. While, the 3 months premium (e.g., Nielsen and Melicher, 1973) may bear the influences of other micro- or macro-economic factors on a target's share price which are irrelevant to the effects of the takeover itself.

Therefore, following Dodd (1980), Asquith (1983) and Abhyankar *et al.* (2008), in this research, premium is calculated as:

$$\text{Takeover Premium} = 100 \times (\text{Offer Price} - P_{4w}) / P_{4w} \quad (4.2)$$

In Equation (4.2),  $P_{4w}$  is a target's share price 4 weeks before the takeover announcement date.

## **4.4 Empirical Results**

### **4.4.1 Impacts of Aggregate Investor Sentiment on Targets' Announcement Returns and Takeover Premium**

The empirical results analysis starts by testing the first hypothesis which examines the relevance of aggregate investor sentiment to targets' announcement returns.

Based on the monthly sentiment indicator, each bid is related to a prevailing sentiment measurement. Following this process, there are 177 (971) transactions, out of the sample of 1148 takeover observations, announced during negative (positive) sentiment months. In order to control the negative value, monthly investor sentiment indicators during the period 1987-2007 are sorted into 5 groups (highest to lowest) according to the value of these sentiment indicators. Each observation is then associated with its current month sentiment classification, which leaves the bottom sentiment group with 174 observations.

Targets' announcement returns over a 3-day and 5-day event window, conditional on prevailing investor sentiment, are presented in Table 4.4. As shown in the table, targets' announcement returns on the whole increase with investor sentiment regardless of the length of the event window, although this increase is

non-monotonic.<sup>57</sup> Targets' 3-day announcement returns generated by the highest sentiment group (group 5) are 3.523% higher than those in the lowest sentiment group (group1); the difference in mean is significant at 5%. Similar results are shown by a difference of means test on targets' 5-day announcement returns, where the difference between the highest and lowest sentiment groups is 4.218% and is statistically significant.

The outperformance, of targets' announcement returns during high prevailing sentiment periods, suggests that investor sentiment influences the way in which the stock market responds to takeover announcements. This lends support to Hypothesis (1), which predicts that prevailing investor sentiment influences targets' announcement returns in the same direction as the sentiment. In addition, the findings are generally in line with the widely documented prediction that excessive demands from optimistic investors during high sentiment periods bid up the prevailing stock prices (e.g., Brown and Cliff, 2005; Kumar and Lee, 2005; Baker and Wurgler, 2006 & 2007; Lemmon and Portniaguina, 2006; Qiu and Welch, 2006).

Moreover, this sentiment-laden announcement return is consistent with the research of Mian and Sankaraguruswamy (2007) who examine the influences of investor sentiment on announcement returns around some other corporate events, including earning announcements, stock splits and dividend payouts. This consistency

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<sup>57</sup> An increase in target announcement returns can be seen from the lowest sentiment group to the highest sentiment group with the exception being Groups 2 and 3, where a dramatic increase shown by Group 2 is followed by an increase in Group 3.



suggests that, similar to the findings on other corporate events, takeover announcements give rise to active trading made by sentiment-laden investors. Hence, a significant amount of sentiment-driven mispricing is expected with the arrival of new information. Furthermore, this mispricing is upward when the prevailing sentiment is high.

Having examined the effects of aggregate investor sentiment on targets' gains, the second hypothesis which predicts the influence of aggregate investor sentiment on takeover premium is then tested. Table 4.4 shows takeover premiums conditional on prevailing investor sentiment. Although there is no monotonic increase in premium as sentiment increases, the difference in premium between lowest and highest sentiment groups is significant. On average, bidders pay a premium of 28.355% when the prevailing investor sentiment is among the top group (Group5). This is 10.5% more than the premium paid during low sentiment months (Group1), and the difference is significant at 1%.<sup>58</sup> These findings support Hypothesis (2) that prevailing investor sentiment exerts an influence on takeover premium.

This driving force of investor sentiment on takeover premium and targets' gains can be explained by investors' evaluation around the takeover announcement period.

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<sup>58</sup> These effects of prevailing sentiment on takeover premium are inconsistent with the empirical results of Zhu *et al.* (2008) concerning the US market. They report that it is begin-of-period sentiment, rather than prevailing sentiment, that is positively related with premium paid. This inconsistency can be attributable to the different measurements of premium. In their study the difference in market to book value between bidders and targets are employed to measure takeover premium; while the widely accepted percentage difference between offer price and the target's share price is used to calculate premium in this research (as in equation (4.2)).

Takeover announcements release new information to the market. Acting upon the arrival of new information, investors value acquired firms' stocks and make buy/sell decisions. During high sentiment periods, sentiment-laden investors trade heavily around newly released information and their evaluation process is impeded by pricing-errors which are influenced by their sentiment. The high trading volume and the mispricing further bid up the share price of target firms. These bidded-up share prices, in turn, require high takeover premiums.

#### **4.4.2 Cross-Sectional Variation in the Role of Investor Sentiment**

As previously mentioned, the prevailing sentiment at an aggregate market level can significantly influence the way in which investors respond to new information and update their beliefs. Specifically, targets' announcement returns and in turn premiums paid are positively related to the sentiment level around takeover announcement periods. However, the documented cross-sectional variations in sentiment (Baker and Wurgler, 2006 & 2007) give rise to the possibility that investors may respond to new information, and further update their beliefs, about different target firms in a different manner.

##### **4.4.2.1 Impacts of Cross-sectional Investor Sentiment on Targets' Announcement Returns**

The examination of the relevance of cross-sectional sentiment to corporate

takeovers starts with testing the third hypothesis which predicts that more speculative targets are more vulnerable to the effects of sentiment on announcement returns. Results from this test are contained in this subsection. Table 4.5 compares differences in both takeover premium and targets' short-run returns when investor sentiment is conditional on firm speculative characteristics. Targets are grouped into high (low) speculation category if the value of their speculativeness proxies, including SIZE, AGE, EPS, DPS, PPE/TA, GS and SIGMA, are among the top (bottom) one thirds of the entire sample, and the rest of them are classified into the neutral group.<sup>59</sup>

The first three columns in Table 4.5 examine cross-sectional variations in the value effects of sentiment, where targets' 5-day announcement returns, generated by the top and bottom sentiment groups (Groups 5 and 1), are compared at each firm speculativeness level. Similar to the findings discussed in section 4.5.1, targets by and large capture higher announcement returns when takeovers are announced during a high prevailing sentiment period than those during a low prevailing sentiment period. The outperformance of target announcement returns during a high sentiment period is likely to be driven by low Sigma, high AGE, high SIZE and high PPE/TA targets.

However, the difference in targets' 5-day announcement returns, between the highest and lowest sentiment groups, is not significant for low AGE, low SIZE, low

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<sup>59</sup> For EPS and DPS, another classification is applied following Baker and Wurgler (2006), where positive (negative) EPS and DPS are included into the high (low) speculation groups, to differentiate profitable and dividends paying firms from non-profitable and non-dividends paying firms. The relevant univariate results are presented in the robustness test section.

EPS, low DPS, low PPE/TA and high SIGMA targets. These firm characteristics, including young age, small size, low profitability, few dividends, low tangibility and high return volatility, are expected to characterise speculative firms (Baker and Wurgler, 2006 & 2007; Mian and Sankaraguruswamy, 2007). Accordingly, these findings show that gains to target firms, with speculative stocks, are not more sensitive to shifts in investor sentiment, which does not support Hypothesis (3).

Moreover, the results on cross-sectional variations in the value effects of sentiment are not consistent with the findings of Mian and Sankaraguruswamy (2007). They document that the stock price sensitivity to corporate news (positive earnings announcements, increases in dividend payout and stock splits) is greater during high sentiment periods and this relation is especially pronounced for small, young, volatile, non-dividend paying or distressed stocks. Since these stocks are regarded as speculative stocks, their results therefore suggest that, in the presence of investor sentiment, the announcement effects of corporate events are more evident for speculative firms.

The inconsistency with literature can be attributable to large institutional holdings in the UK market, compared with the US market. Cross-sectional variations of investor sentiment rest on the premise that a speculative demand, combined with limits on arbitrage speculative stock, generates the mispricing of speculative stocks (Baker and Wurgler, 2006). As noise trading risk and implementation costs are

expected to be lower for high institution holdings (Phalippou, 2005), the concentrated institutional presence in UK market therefore enables effective arbitrage (Alexandridis *et al.*, 2006). Consequently, if speculative targets have high institutional holdings that present strong arbitrage forces, then the mispricing influenced by investor speculative demands will not be persistent. Hence, speculative targets are not more vulnerable to the influence of sentiment on announcement-period returns.

In addition, in the takeover context, announcement returns are primarily driven by takeover bids rather than general market conditions, as in some other asset pricing studies. Investors do not evaluate speculative targets more, even if the prevailing sentiment is high. Taking over speculative targets is a risky project, regardless of the prevailing sentiment. Therefore, fluctuations in investor sentiment do not cause more sensitive stock response to speculative target firms.

#### **4.4.2.2 Impacts of Cross-sectional Investor Sentiment on Takeover Premium**

Having examined the effects of cross-sectional investor sentiment on targets' announcement returns, the fourth hypotheses is then tested in this subsection which suggests that the impacts of sentiment on takeover premium are more pronounced for more speculative targets. The last three columns in Table 4.5 examine the cross-sectional variations in the relevance of sentiment to takeover premium, where premium in the highest and lowest sentiment groups (Groups 5 and 1) are compared at

each firm speculativeness level. As shown in the table, acquiring firms generally pay higher premiums if the mergers are announced during high sentiment periods than those announced during low sentiment periods.

However, this driving force of sentiment on takeover premium cannot be generalizable for the entire sample. Specifically, for some of the more speculative targets (low AGE, low PPE/TA and high SIGMA firms), the difference in premium between the lowest and highest sentiment groups is not significant. On the other hand, the premium required by less speculative targets (high AGE, high EPS, high DPS, high PPE/TA and low SIGMA firms) are significantly higher during high sentiment months than those during low sentiment months. These results suggest that premiums paid to more speculative targets are not more sensitive to shifts in investor sentiment, which is inconsistent with Hypothesis (4). A lack of such sensitiveness is likely to be the consequence of the insignificant difference in speculative targets' gains between a high and low sentiment period. More specifically, there is no sentiment driven over-pricing (under-pricing) to push up (pull down) the premium required by more speculative targets.

Moreover, bidders regard more speculative firms as risky targets. Given an available pool of potential target firms, they would not pay more for those associated with greater uncertainty and risk, even if the transaction is announced during a high

sentiment period.<sup>60</sup> On the other hand, a target's information uncertainty reduces the pool of potential buyers due to related information costs in obtaining the firm's information. This further weakens the target's bargaining power in obtaining a high premium (Mantecon, 2008).<sup>61</sup> Therefore, even a high sentiment rarely drives up the premium required by speculative targets because of the loss of their bargaining power in the battle for corporate control.

#### 4.4.3 Cross-sectional Regression Analysis

Results from the above discussed univariate tests show that investor sentiment, at an aggregate market level, exerts an influence on targets' gains, and thus takeover premium, in the same direction as this sentiment. The sentiment effects further show cross-sectional differences. Specifically, more speculative target firms are less vulnerable to these sentiment effects. The validity of these results is examined by cross-sectional regression analyses in this subsection.

In order to examine the relevance of aggregate and cross-sectional sentiment to targets' announcement returns (Hypotheses (1) and (3)), the following cross-section

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<sup>60</sup> This rationale further suggests that managers of acquiring firms rationally value their target firms and discreetly decide the takeover premiums that will be paid to these targets. Thus, managerialism motives (Black, 1989) are not the driving force in this evaluation and decision process. Therefore, managers do not knowingly overpay for their acquired firms, which answers the second research question.

<sup>61</sup> In addition to the effects of information costs in lowering takeover premium, Mantecon (2008) also suggests that if a firm is surrounded by high levels of uncertainty, then it will expect high capital costs and severe adverse selection problems. This will limit its access to external financing and its opportunity of operating as a stand alone entity. Once this firm becomes a target in the market for corporate control, these disadvantages have detrimental effects on its bargaining power.

regression is estimated:

$$R_i - R_m = \alpha + \beta_1 \text{SENTIMENT}_t + \beta_2 \text{ControlVariable}_{it} \quad (4.3)$$

In equation (4.3), the regressand is the targets' 5-day accumulative abnormal returns based on a market-adjusted model. SENTIMENT is a dummy variable for prevailing sentiment, which takes the value of 1 (0), if the monthly sentiment indicator falls into the top (bottom) 20% of the sample period. ControlVariable includes some factors which are suggested to be related with targets' short-run returns, including Multiple Bidder Dummy, targets' debt to equity ratio (DE), targets' free cash flow per share (FCF), targets' market to book value (MTBV), targets' market value (MV), Transaction Attitude Dummy, Cash Dummy, Listed Bidder Dummy.<sup>62</sup>

In this regression,  $\beta_1$  picks up the value effects of market level investor sentiment. If  $\beta_1$  is not significantly different from 0, then sentiment has no valuation effects; if  $\beta_1$  is significantly positive, then investor sentiment influences targets' announcement returns in the same direction as the sentiment as expected by Hypothesis (1). When this regression is applied to subsamples of targets sorted on their speculative characteristics,  $\beta_1$  can capture the influence of cross-sectional variations in investor sentiment. More specifically, the estimated  $\beta_1$  for a subsample of more speculative targets is compared with the estimated  $\beta_1$  for a subsample of less speculative targets. If the explanatory power of investor sentiment ( $\beta_1$ ) is indifferent between these two subsamples, then the valuation effects of sentiment does not present cross-sectional

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<sup>62</sup> For a discussion on the rationale of using these control variables, see section 4.3.3.



variations. On the other hand, if  $\beta_1$  has higher explanatory power for speculative targets, then the announcement returns of speculative targets are more vulnerable to sentiment, as expected by Hypothesis (3).

The estimation begins by estimating the regression model (Equation (4.3)) for the entire sample to test Hypothesis (1). Column 1 of Table 4.6 reports a significantly positive coefficient of 0.042 for SENTIEMNT after factors, which have a potential influence on targets' announcement returns, have been controlled. This positive relation suggests that the integrated market-level sentiment influences the response of stock market towards a takeover announcement in the same direction as this sentiment. Therefore, Hypothesis (1) is supported.<sup>63</sup>

Further, equation (4.3) is then estimated separately for sub-samples, of targets sorted by their speculative characteristics, to test Hypothesis (3). This hypothesis examines the cross-sectional variations in the valuation effects of investor sentiment.

The coefficient estimation of sentiment ( $\beta_1$ ) for each sub-sample is presented in column 1 Table 4.7. The most striking feature of column 1 is that most of the sentiment coefficients are statically insignificant in subsamples of targets falling into the low value group, with the only exception being low SIGMA. On the other hand,

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<sup>63</sup> In addition to the findings on investor sentiment, estimated coefficients of most control variables are significant and generally consistent with findings in existing literature (Bauguess *et al.*, 2007). Multiple bidders, small target size, cash payment, hostile offers and listed bidders are all significantly positively related to targets' announcement returns.

the high value subsamples, for example high AGE, high SIZE and high PPE/TA firms, generally have a significant sentiment coefficient. This difference reveals that more speculative targets, classified into the low AGE, low SIZE, low EPS, low DPS and high SIGMA subgroups, are not more susceptible to shifts in investor sentiment around takeover announcement periods, which does not support Hypothesis (3).

In summary, results from the cross-sectional regression analyses are consistent with the findings based on univariate tests. When sentiment is high at an aggregate market level, targets on the whole capture high announcement returns. Significant bidders' gains during these high sentiment months are the result of both sentiment driven- mispricing and intensive trading volume around takeover announcement periods. More specifically, during a high sentiment period, sentiment-laden investors trade heavily around newly released information and their evaluation of a target firm's asset is impeded by their sentiment involved. These sentiment influenced mispricing and intensive trading volume can bid up targets' announcement returns.

Furthermore, the value effects of sentiment around takeover announcements vary across acquired firms. However, contrary to the prediction that more speculative stock is more vulnerable to investor sentiment (as in the study of Baker and Wurgler, 2006 and Mian and Sankaraguruswamy, 2007), this sentiment influenced mispricing is not evident for more speculative targets. This inconsistency can be explained by large institutional holdings in the UK market, which enable effective arbitrage

(Alexandridis *et al.*, 2006). Since it is the speculative demand combined with the limits on arbitrage speculative stock that generates mispricing on speculative stocks (Baker and Wurgler, 2006), this mispricing is not persistent where speculative targets have high institutional holdings. Additionally, announcement returns are primarily driven by takeover bids rather than general market condition. Taking over speculative targets is regarded as a risky project, regardless of the prevailing sentiment. Therefore, investors do not evaluate speculative targets more, even if the prevailing sentiment is high. Consequently, fluctuations in sentiment do not cause more sensitive stock response to speculative target firms.

Having discussed the relevance of aggregate and cross-sectional sentiment to targets' announcement returns (Hypotheses (1) and (3)), the predicted effects of investor sentiment on takeover premium (Hypotheses (2) and (4)) is then examined. This analysis follows a process similar to what has been previously used in this subsection, which is based on estimating the following cross-section regression equation:

$$Premium = \alpha + \beta_1 SENTIMENT_t + \beta_2 ControlVariable_{it} \quad (4.4)$$

In equation (4.4), the regressand is the takeover premium calculated by equation (4.2). SENTIMENT and ControlVariable are identical to those in equation (4.3). In this regression,  $\beta_1$  picks up the effects of market level sentiment on takeover premium. If  $\beta_1$  is not significantly different from 0, then sentiment is irrelevant to takeover

premium; while if  $\beta_1$  is significantly positive, then investor sentiment influences premium in the same direction as this sentiment, as expected by Hypothesis (2). Comparing the estimated  $\beta_1$ s in different subsamples, of targets sorted by their speculativeness, can capture cross-sectional variations in the sentiment-driven premium. If the explanatory power of investor sentiment ( $\beta_1$ ) is indifferent across subsamples, then there is no cross-sectional variation in the sentiment-driven premium. On the other hand, if  $\beta_1$  has higher explanatory power for speculative targets, then premiums paid to more speculative targets are more vulnerable to sentiment, as expected by Hypothesis (4).

In order to test Hypothesis (2), the regression model (Equation (4.4)) is estimated for the entire sample. As reported in column 2 of Table 4.6, SENTIEMNT has a positive coefficient of 9.335 after other suggested premium determinants have been controlled. This positive relation suggests that a high aggregate market-level sentiment can push up the premiums paid by bidders in acquiring target firms. This supports Hypothesis (2).

It is also important to note that the estimated coefficients of control variable MV is -0.001, presenting a significantly negative relation between premiums paid and target size. This negative coefficient suggests the importance of economic gains from takeovers in deciding how much to pay for a target. More specifically, since a small target size tends to suggest a high likelihood of a successful integration after a

takeover, acquirers focusing on strategic fit would likely offer relatively high premium to small targets (Gondhalekar *et al.*, 2004). This evidence suggests that the decisions to merge are not flooded with private managerial gains. Instead, managers from acquiring firms may rationally value their investment and forecast future operations.

Further, equation (4.4) is then estimated separately for sub-samples, of targets sorted by their speculative characteristics, to test Hypothesis (4). This hypothesis examines the influence of cross-sectional sentiment on takeover premium. The coefficient estimations of sentiment ( $\beta_1$ ) are presented in column 2 of Table 4.7. As shown, less speculative subsamples are dominated by significant sentiment coefficients. More speculative subsamples, on the other hand, are not significantly sensitive to fluctuations in sentiment, when a firm's speculativeness is measured by high SIGMA, low AGE, low DPS and low EPS. Therefore, Hypothesis (4) does not stand.

In summary, these results from the cross-sectional regression analyses suggest that high market level sentiment has the potential of driving up takeover premiums as predicted by Hypothesis (2). This effect may take place through the over-pricing of target firms, which is under the influence of sentiment. Specifically, a high sentiment is likely to give rise to upward pricing errors and intensive trading volume around takeover announcement periods, which further bid up target firms' share prices. Given the bidded up share prices, high takeover premiums are therefore required by these

target firms.

However, contrary to Hypothesis (4), more speculative targets are not exposed to more sentiment effects. The lack of such sensitiveness in the takeover premium paid to speculative targets can be the consequence of the absence of sentiment-driven over-pricing (under-pricing) that pushes up (pulls down) the premium required by more speculative targets. Moreover, bidders regard more speculative firms as risky targets. Given an available pool of potential target firms, more would not be paid for those associated with greater uncertainties and risks, even if the transaction were announced during a high sentiment period. On the other hand, a target's information uncertainty reduces the pool of potential buyers due to the related information costs; this further weakens the target's bargaining power in obtaining a high premium (Mantecon, 2008). Given this loss of bargaining power, even a high sentiment rarely drives up the premiums required by speculative targets.

#### **4.4.4 Robustness Tests**

Results from both univariate tests and cross-sectional regression analyses show that high investor sentiment, at an aggregate market level, drives up targets' gains and hence takeover premium. This is supporting evidence for Hypotheses (1) and (2). When the sample is partitioned into subsamples according to the speculativeness shown by target firms, these effects of sentiment become less evident for more

speculative targets. These findings do not support Hypotheses (3) and (4), and are inconsistent with the studies of Baker and Wurgler (2006 & 2007) and Mian and Sankaraguruswamy (2007) where stock performance of speculative firms is more vulnerable to shifts in investor sentiment. This inconsistency with extant literature, existing in the cross-sectional effects of investor sentiment, is re-examined with the robustness tests in this section. In these tests, different speculativeness classification and cross-sectional regression analysis are used.

In the previous analyses, speculative targets are firms which fall into the bottom 1/3 of total observations sorted by their EPS or DPS. However, if it is whether or not dividends are paid rather than the amount of dividend payouts that determines the speculativeness of a firm (Baker and Wurgler, 2006; Mian and Sankaraguruswamy, 2007), then more speculative targets should be represented by non-dividend paying firms instead of companies whose dividend payout is among the bottom one third of all targets. Similarly, non-profitable firms should correspond to more speculative targets rather than those whose EPS fall into the bottom one third.

Table 4.8 reports the effects of investor sentiment on targets' announcement returns and takeover premium which are conditional on whether a target is a dividend-paying or profitable firm. As shown in the table, when dividend paying or profitable targets are acquired, high investor sentiment significantly drives up these firms' announcement returns and in turn the premium required. However, there is no

such effect for speculative, i.e. non- dividend-paying and unprofitable, targets.

Moreover, in section 4.5.4, cross-sectional regressions (equation (4.3) and (4.4)) are applied to subsamples with different levels of speculativeness. Accordingly, the effects of cross-sectional investor sentiment are examined. For robustness test reasons, a different methodology is employed. More specifically, an interacting term between market level sentiment and firm's speculativeness is included as in the following regression equations:

$$R_i - R_m = \alpha + \beta_1 SENTI_t \times Speculative + \beta_2 SENTI_t \times NonSpeculative + \beta_3 CV_{it} \quad (4.5)$$

$$Premium = \alpha + \beta_1 SENTI_t \times Speculative + \beta_2 SENTI_t \times NonSpeculative + \beta_3 CV_{it} \quad (4.6)$$

In equations (3.5) and (3.6), CV is a vector of control variables and SENTI is investor sentiment. Both of them, as well as the regressants, are identical to those in previous analyses (see section 4.4.3). The Speculative and NonSpeculative in the interaction terms are vectors of dummy variables based on speculativeness proxies ((non-)dividend-paying and (non-)profitable). The coefficient  $\beta_1$  ( $\beta_2$ ) of the interacting term measures the influence of firm-specific sentiment on speculative (non-speculative) targets. More specifically, if  $\beta_1$  ( $\beta_2$ ) is not significantly different from 0, then the effects of investor sentiment have no cross-sectional differences; if  $\beta_1$  ( $\beta_2$ ) is non-zero, then the role of sentiment varies across stocks.

Table 4.9 presents the estimated coefficients of  $\beta_1$  and  $\beta_2$ . The interacting term between prevailing investor sentiment and less speculative targets has significantly



positive effects on both announcement returns and takeover premium, as shown by models (2), (4), (6) and (8). On the other hand, as shown by models (1), (3), (5) and (7), neither targets' announcement returns nor takeover premium are driven by the interaction between prevailing investor sentiment and speculative targets.

These robustness tests report similar findings to those in previous analyses. This indicates that the drawn conclusions concerning the cross-sectional effects of investor sentiment on targets' announcement returns and takeover premium remain unchanged after both speculativeness classification and methodology employed have been controlled. Announced returns generated by speculative targets are not more vulnerable to fluctuations in investor sentiment. Further, this insensitiveness leads to unvarying takeover premiums as sentiment level increases.

## 4.5 Conclusions

According to the market efficiency theory (Fama, 1970), stock prices in an efficient market should reflect fundamental factors. Fluctuation in a non-fundamental factor, for example investor sentiment, should not cause price volatility. Both anecdotal evidence and behavioural finance literature, however, present the existence of systematic mispricing and thus suggest investor sentiment as an irrational exuberance that drives asset prices away from their fundamental values (e.g., Brown and Cliff, 2005). The implications of this sentiment influenced-mispricing have

previously been applied to research areas such as Initial Public Offerings (Helwege and Liang, 2004; Lowry, 2003; Derrien and Kecskes, 2007) and dividend payouts (Baker and Wurgler, 2004a & 2004b).

In the context of mergers and acquisitions, this study examines whether the stock market's response to takeover announcements is exposed to shifts in investor sentiment. Based on a sample of 1148 UK bids announced during the period 1987-2007, the results from both univariate tests and cross-sectional regression analyses suggest that prevailing investor sentiment, in general, influences target firms' announcement returns in the same direction as the sentiment. More specifically, targets' cumulative abnormal returns are significantly higher during the highest sentiment periods than during the lowest sentiment periods. This effect of prevailing sentiment on stock returns is consistent with the finding of Brow and Cliff (2005), Lemmon and Portniaguina (2006) and Qiu and Welch (2006).

Meanwhile, upward sentiment driven mispricing tends to push up premiums required, as a co-movement between investor sentiment and takeover premium persists during most of the sample period. The position of prevailing sentiment as one of the premium determinants is further confirmed by cross-sectional regression analyses. The results of these analyses show that takeover premium is significantly influenced by the prevailing investor sentiment after the effects of other firm and deal characteristics, such as target size, debt ratio, free cash flow, bidder's public status,

multiple bidders, takeover anticipation, method of payment and deal attitude, have been controlled.

In addition to the analysis on market-wide sentiment, cross-sectional variations in the effects of sentiment are also addressed. In doing so, the sensitivities of announcement returns and takeover premium to sentiment are attended to at an individual-target level. In line with Baker and Wurgler (2007), targets are divided into high, neutral and low speculativeness categories according to the value of their speculative characteristic proxies, measured by SIZE, AGE, EPS, DPS, PPE/TA, GS, MTBV and SIGMA. Stocks falling into the high speculation category are expected to be more vulnerable to the effects of shifts in investor sentiment (Baker and Wurgler, 2006 & 2007; Mian and Sankaraguruswamy, 2007). In this study, however, targets with greater speculative stocks are not more sensitive to the effects of investor sentiment on announcement returns, as the difference in speculative targets' gains between high and low sentiment periods is not significant. Similar patterns are presented by empirical results on takeover premium, where the positive effect of high sentiment on takeover premium is not more pronounced for speculative targets.

The inconsistency between this work and existing literature can be attributable to large institutional holdings in the UK market compared with the US market. Cross-sectional variations in the valuation effects of sentiment rest on the premise that a speculative demand, combined with limits on arbitrage speculative stock, generates

the mispricing of speculative stocks (Baker and Wurgler, 2006). Since noise trading risk and implementation costs are expected to be lower for high institution holdings (Phalippou, 2005), the concentrated institutional presence in UK market therefore enables effective arbitrage (Alexandridis *et al*, 2006). Consequently, if speculative targets have high institutional holdings, which present strong arbitrage forces, then the mispricing driven by investor speculative demands will not be persistent. Hence, the value effects of sentiment should not be more evident for speculative targets.

Additionally, takeover announcement returns should be driven primarily by takeover bids rather than general market conditions. Taking over speculative targets is regarded as a risky project, regardless of the prevailing sentiment. Investors do not evaluate speculative targets more, even if the prevailing sentiment is high. Meanwhile, bidders, given an available pool of potential takeover targets, would not pay more for those associated with greater uncertainties and risks, even if the transaction were announced during a high sentiment period. On the other hand, a target firm's information uncertainty reduces the pool of potential buyers due to the related information costs; this further weakens the target's bargaining power in obtaining a high premium (Mantecon, 2008). Given this loss of bargaining power, even a high sentiment rarely drives up the premium required by speculative targets. Therefore, a shift in sentiment does not cause a more sensitive stock response or higher premium to be paid to target firms.

In general, the aforementioned empirical results suggest that investor sentiment, at an aggregate market level, influences the way in which the stock market interprets and responds to takeover announcements; namely by influencing the market reaction in the same direction as the prevailing sentiment. Takeovers disseminate information to the market. Acting upon the newly released information, investors evaluate target firms' assets and growth opportunities. During a high sentiment period, sentiment-laden investors trade heavily around this newly arrived information, and their evaluation is likely to be impeded by their sentiment involved. Both the high trading volume and the sentiment influenced pricing-errors can bid up the share prices of acquired firms. These bidden-up share prices, in turn, require high takeover premiums.

These empirical results, combined with the reported negative relation between a target's size and takeover premium,<sup>64</sup> suggest that the decision to merge is not flooded with private managerial gains. Instead, managers from acquiring firms may rationally evaluate their investments and forecast future operations. Hence, it is less likely that managers knowingly overpay in acquiring targets.

The empirical findings, together with the related theoretical implications, complement findings in extant studies on investor sentiment by showing that the influence of sentiment on stock returns extends beyond its original setting, within asset pricing, to the context of mergers and acquisitions. Both aggregate and cross-sectional investor sentiment have a certain bearing on targets' announcement

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<sup>64</sup> This negative coefficient suggests the importance of economic factors in deciding how much to pay for a target. More specifically, since small size tends to suggest a high likelihood of successful integration after takeover, acquirers focusing on a strategic fit would likely offer a relatively high premium to small targets (Gondhalekar *et al.*, 2004).

returns and takeover premium. Furthermore, the results contribute to the ongoing debate concerning the managerialism motives in takeover overpayment. More specifically, they add to the understanding of how takeover premium is determined with an investor sentiment factor. Therefore, the traditional managerialism consideration no longer serves as the main explanation for the overpayment of target firms.

In addition to providing some original insight to existing literature in relation to investor sentiment and takeovers, this research also sheds light on the issue of investor sentiment by bringing new techniques to this research area. Following Baker and Wurgler (2006), a relatively comprehensive investor sentiment indicator, rather than other noisy sentiment proxies, is constructed for the UK market for the period of 1987-2007. The Baker and Wurgler (2006) sentiment index has been extensively used by financial economists since it was developed (e.g., Derrien and Kecskes, 2007; Zhu *et al.*, 2008; Mian and Sankaraguruswamy, 2007), as it extracts the common variation of several suggested sentiment proxies and lines up perfectly with anecdotal evidence in the US stock market. However, up until now, to the best of the author's knowledge, no such sentiment index had been available for the UK market. Therefore, the constructed sentiment indicator can assist further research on UK investor sentiment.

Besides financial economists, who are engaged in the research area of investor sentiment, companies in the takeover market form the second group of beneficiaries of this research. The results on cross-sectional investor sentiment show that target firms, surrounded by great information uncertainty, rarely capture any upward sentiment-influenced premiums or short-run abnormal returns. Accordingly, managers

from these firms should increase the information transparency of their firms, for example, by expanding their firms' market presence. This improved transparency can yield some sentiment-driven economic gains to these target firms.

Following on from this conclusion which regards the value effects of investor sentiment in interpreting takeover announcements, as well as the conclusion of the previous chapter regarding the value effects of information contents signalled by takeover announcements under misvaluation, the opposite end of the information dissemination process via takeover announcements (i.e., information senders) also needs to be considered. This will enable a better and all around understanding of the relevance of information environment to takeover gains. Therefore, a focus will be given to information sender (information asymmetry surrounding acquiring firms) in the next empirical chapter. Addressing information asymmetry is also a natural development upon the empirical findings, on the value effects of misvaluation, from chapter 3. This misvaluation can be associated with many factors, for example investor sentiment and information asymmetry. The influence of investor sentiment on takeover gains has been examined in this chapter; the effects of information asymmetry will be researched in chapter 5.

**Figure 4.1. Takeover premium and Investor Sentiment**

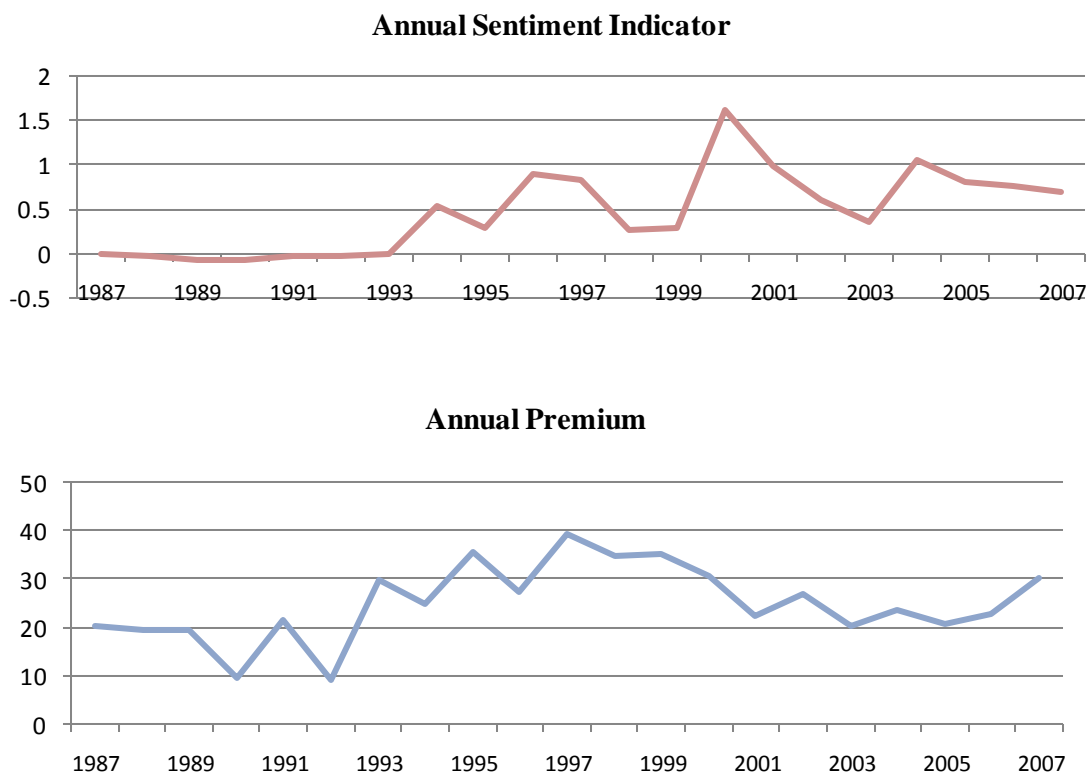
This graph illustrates acquisition activity and investor sentiment during the 1987-2007 sample periods. Mean values of premium and SENTIMENT on an annual basis are plotted. The sentiment is calculated as:

$$SENTIMENT_t = -0.446ITD_{t-1} + 0.064TURN_{t-1} + 0.527NIPO_t + 0.337CCI_{t-1} \quad (4.1)$$

The premium is measured as:

$$Premium = 100 \times (offer\ price - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date.

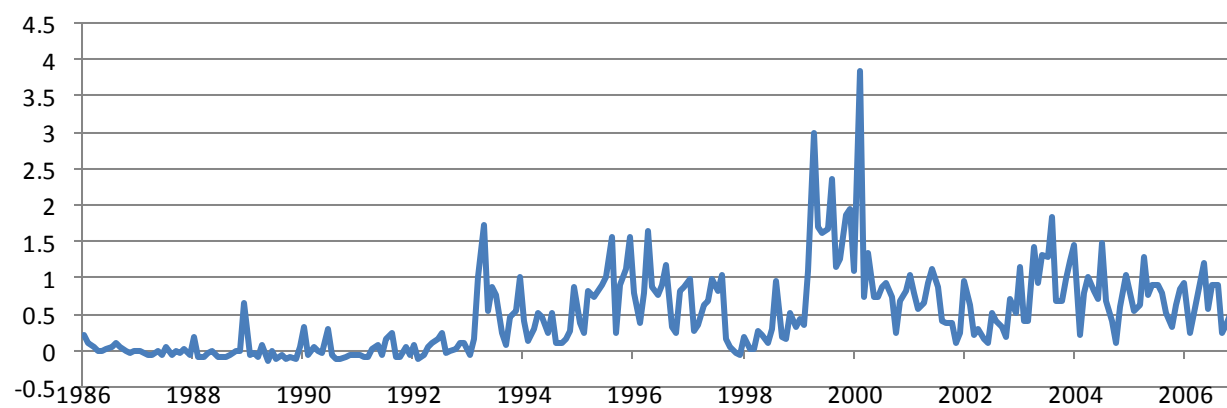




**Figure 4.2. Sentiment Indicator**

This graph demonstrates the fluctuations of investor sentiment during the sample period of 1987-2007. Investor sentiment is captured by a sentiment indicator, which is calculated as:

$$SENTIMENT_t = -0.446ITD_{t-1} + 0.064TURN_{t-1} + 0.527NIPO_t + 0.337CCI_{t-1} \quad (4.1)$$



**Table 4.1. Sample Descriptions**

The descriptive statistics in this table are based on the sample of 1,148 acquisitions. Acquisitions announced during the period 1987-2007 are included in this sample, if the target is a UK firm listed in LSE, AIM, USM or London Tech with more than £1 mil market value and with sufficient DataStream data. Moreover, the deal value is also required to be over £1 mil. Transaction value is presented in £mil. CAR(-2, 2) is the 5-day window abnormal returns to targets. The premium is measured as:

$$\text{Premium} = 100 \times (\text{offer price} - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. The sentiment is calculated as:

$$\text{SENTIMENT}_t = -0.446\text{ITD}_{t-1} + 0.064\text{TURN}_{t-1} + 0.527\text{NIPO}_t + 0.337\text{CCI}_{t-1} \quad (4.1)$$

Market value of equities is used as a proxy of firm size (SIZE), measured at the calendar year end, prior to announcement date. Firm age (AGE) is the number of days from a firm's based date to the acquisition announcement date. Earning per share (EPS) measures a firm's profitability. Asset tangibility is measured as a firm's property, plant and equipment scaled by its total assets (PPE/TA). Return volatility (SIGMA) is the standard deviation of market adjusted residual of targets' daily stock returns measured during the period (t-205, t-6), where t is the acquisition announcement date. Growth in sales (GS), which is the change in net sales of a firm divided by its net sales in the prior year, is the proxy for growth opportunity. Apart from SIZE, AGE and SIGMA, all of other speculative characteristics variables are measured at the fiscal year end, prior to the takeover announcement day.

	<i>Number</i>	<i>Deal Value</i>	<i>Targets' CAR5D (%)</i>	<i>Premium</i>	<i>SENTIMENT</i>	<i>Firm Speculative Characteristics</i>						
						<i>AGE</i>	<i>Size</i>	<i>EPS</i>	<i>DPS</i>	<i>PPE/TA</i>	<i>GS</i>	<i>SIGMA</i>
<b>All</b>	1148	434.425	14.891***	26.465	0.578	5722.287	547.426	1.482	0.081	1.182	0.194	0.024
<b>Cash Offer</b>	699	262.412	16.673***	28.873	0.606	5685.607	440.734	0.091	0.071	1.054	0.216	0.025
<b>Equity Offer</b>	134	962.176	13.645***	25.246	0.703	5289.410	911.501	0.135	0.055	1.200	0.144	0.026

**Table 4.2. Annual Premium and Sentiment**

This table shows acquisition activity and investor sentiment during the 1987-2007 sample period. Mean value of CAR (-2, 2), premium and SENTIMENT are presented on an annual basis. CAR (-2, 2) is the 5-day window abnormal returns to targets. The premium is measured as:

$$Premium = 100 \times (offer\ price - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. The sentiment is calculated as:

$$SENTIMENT_t = -0.446ITD_{t-1} + 0.064TURN_{t-1} + 0.527NIP O_t + 0.337CCI_{t-1} \quad (4.1)$$

Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Year</i>	<i>Number</i>	<i>CAR5D</i>	<i>Premium</i>	<i>SENTIMENT</i>
<b>1987</b>	6	15.193**	20.29	0.012
<b>1988</b>	6	13.380*	19.565	-0.009
<b>1989</b>	39	7.896***	19.272	-0.055
<b>1990</b>	62	7.477***	9.437	-0.06
<b>1991</b>	39	17.339***	21.369	-0.02
<b>1992</b>	24	10.527**	9.229	-0.012
<b>1993</b>	26	9.888**	29.791	0.017
<b>1994</b>	24	6.653*	24.881	0.542
<b>1995</b>	40	14.161***	35.284	0.308
<b>1996</b>	50	17.100***	27.325	0.911
<b>1997</b>	46	22.827***	39.032	0.842
<b>1998</b>	86	22.265***	34.478	0.287
<b>1999</b>	146	19.879***	34.919	0.306
<b>2000</b>	98	15.238***	30.501	1.62
<b>2001</b>	41	14.720***	22.394	0.987
<b>2002</b>	51	17.868***	26.914	0.605
<b>2003</b>	82	9.506***	20.188	0.377
<b>2004</b>	54	15.993***	23.561	1.069
<b>2005</b>	69	12.074***	20.735	0.805
<b>2006</b>	88	11.226***	22.539	0.763
<b>2007</b>	71	14.738***	29.878	0.702

**Table 4.3. Investor Sentiment Data, Dec 1986- Dec 2007**

This table reports the summary statistics of sentiment indicator components and their correlations with the constructed sentiment indicator. The investment trust discount (ITD) is the monthly weighted average difference between the net asset value of investment trust shares and their market prices. FTSE turnover (TURN) is based on the total number of constituent shares traded on a particular day. Since turnover presents an upward trend during the sample period, the natural log of the raw turnover volume is then detrended by removing the 5-year moving average to generate TURN. Consumer confidence index (CCI) is the difference between current month confidence index and its average value over sample period. Similarly, number of IPOs (NIPO) is the difference between current month IPO volume and its average value over sample period. Following first principle component analysis, the sentiment indicator is calculated as:

$$SENTIMENT_t = -0.446ITD_{t-1} + 0.064TURN_{t-1} + 0.527NIPO_t + 0.337CCI_{t-1} \quad (4.1)$$

<i>Sentiment Indicator Components</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Correlation Coefficients with</i>				
					<i>Sentiment Indicator</i>	<i>NIPO<sub>t</sub></i>	<i>ITD<sub>t-1</sub></i>	<i>CCI<sub>t-1</sub></i>	<i>TURN<sub>t-1</sub></i>
<b>NIPO<sub>t</sub></b>	1.000	1.032	0	7.257	0.998	1.000			
<b>ITD<sub>t-1</sub></b>	0.125	0.061	0.021	0.274	-0.553	-0.540	1.000		
<b>CCI<sub>t-1</sub></b>	-0.0001	0.076	-0.202	0.148	0.377	0.339	-0.258	1.000	
<b>TURN<sub>t-1</sub></b>	0.002	0.288	-0.730	0.877	0.127	0.097	0.149	0.175	1.000

**Table 4.4. Investor Sentiment, Premium and Targets' Gains**

This table reports targets' cumulative abnormal returns (CARs) and takeover premium conditional on prevailing investor sentiment. Monthly investor sentiment indicators between 1987 and 2007 are sorted into 5 groups, where Group 5 represents the highest sentiment classification. The difference in CARs between sentiment Group 1 and 5 is presented in the last column (HML). CAR (-2, 2) and CAR (-1, 1) is the abnormal returns to targets over a 5-day and a 3-day window respectively. The premium is measured as:

$$\text{Premium} = 100 \times (\text{offer price} - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. No. of observations are provided in parenthesis. T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

		<i>Sentiment</i>					<i>HML</i>
		<i>Group 1</i>	<i>Group2</i>	<i>Group3</i>	<i>Group4</i>	<i>Group5</i>	<i>(Group5-Group1)</i>
<b>No.</b>		174	181	271	231	291	
<b>Sentiment</b>	<b>Mean</b>	-0.078***	0.110***	0.348***	0.749***	1.341***	1.419***
	<b>t-Value</b>	-36.18	24.30	59.63	109.66	45.19	47.67
<b>Premium</b>	<b>Mean</b>	17.855***	30.088***	27.441***	26.587***	28.355***	10.500***
	<b>t-Value</b>	8.33	12.66	16.59	13.37	18.26	4.03
<b>CAR3D</b>	<b>Mean</b>	11.619***	16.014***	13.969***	13.626***	15.142***	3.523**
	<b>t-Value</b>	8.75	11.21	11.75	10.23	13.75	2.01
<b>CAR5D</b>	<b>Mean</b>	11.807***	17.042***	14.990***	13.988***	16.025***	4.218**
	<b>t-Value</b>	8.37	10.87	12.30	10.44	14.06	2.30

**Table 4.5. Premium, Targets' Gains, Investor Sentiment and Firm Speculative Characteristics**

This table compares takeover premium and targets' short-run returns (CARs) conditional on investor sentiment and firm speculative characteristics. A target is grouped into a high (low) speculation category if the value of its speculative characteristics proxies, including SIZE, AGE, EPS, DPS, PPE/TA, GS and SIGMA, fall into the top (bottom) one thirds of those in the entire sample. The rest are classified into the neutral group. Market value of equities is used as a proxy of firm size (SIZE), measured at the calendar year end, prior to announcement date. Firm age (AGE) is the number of days from a firm's based date to the acquisition announcement date. Earning per share (EPS) measures a firm's profitability. Asset tangibility is measured as a firm's property, plant and equipment scaled by its total assets (PPE/TA). Return volatility (SIGMA) is the standard deviation of market adjusted residual of targets' daily stock returns measured during the period (t-205, t-6), where t is the acquisition announcement date. Growth in sales (GS), which is the change in net sales of a firm divided by its net sales in the prior year, is the proxy for growth opportunity. Apart from SIZE, AGE and SIGMA, all of other speculative characteristics variables are measured at the fiscal year end, prior to the takeover announcement day. HML presents the difference in CARs and premium between sentiment Group 1 and 5. CAR(-2,2) is the 5-day window abnormal returns to targets. The premium is measured as:

$$\text{Premium} = 100 \times (\text{offer price} - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. No. of observations are provided in parenthesis. T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Speculative Characteristics</i>		<i>CAR(-2,2)</i>		<i>HML</i> (Group5-Group1)	<i>Premium</i>		<i>HML</i> (Group5-Group1)
		<i>Sentiment Group1</i>	<i>Sentiment Group5</i>		<i>Sentiment Group1</i>	<i>Sentiment Group5</i>	
<b>Low Age</b>	<b>Mean</b>	12.742***	12.977***	0.235	20.924***	24.899***	3.975
	<b>t-Value</b>	4.72	9.19	0.08	5.45	9.78	0.88
	<b>N</b>	(44)	(90)		(44)	(90)	
<b>High Age</b>	<b>Mean</b>	13.213***	19.860***	6.647**	17.603***	32.645***	15.042***
	<b>t-Value</b>	6.17	7.61	1.98	5.78	10.26	3.42
	<b>N</b>	(90)	(83)		(90)	(83)	
<b>Low Size</b>	<b>Mean</b>	18.181***	21.849***	3.668	23.492***	37.223***	13.731**
	<b>t-Value</b>	5.64	7.83	0.82	6.03	9.59	2.50
	<b>N</b>	(47)	(87)		(47)	(87)	
<b>High Size</b>	<b>Mean</b>	8.060***	12.896***	4.836*	13.296***	22.907***	9.611**
	<b>t-Value</b>	4.30	7.90	1.94	3.88	10.96	2.40
	<b>N</b>	(71)	(95)		(71)	(95)	
<b>Low DPS</b>	<b>Mean</b>	11.907***	15.400***	3.493	18.476***	28.599***	10.123*
	<b>t-Value</b>	3.10	7.69	0.84	3.29	9.36	1.67
	<b>N</b>	(32)	(102)		(32)	(102)	
<b>High DPS</b>	<b>Mean</b>	11.629***	15.706***	4.077	14.866***	27.873***	13.007***
	<b>t-Value</b>	6.53	8.06	1.54	4.37	10.90	3.12
	<b>N</b>	(68)	(94)		(68)	(94)	

Table 4.5 continued

<b>Low EPS</b>	<b>Mean</b>	13.576***	16.530***	2.954	19.547***	30.106***	10.559*
	<b>t-Value</b>	4.14	7.83	0.75	3.52	9.29	1.70
	<b>N</b>	(38)	(95)		(38)	(95)	
<b>High EPS</b>	<b>Mean</b>	11.802***	15.446***	3.644	14.089***	27.020***	12.931***
	<b>t-Value</b>	6.59	8.21	1.40	5.05	11.22	3.51
	<b>N</b>	(75)	(101)		(75)	(101)	
<b>Low GS</b>	<b>Mean</b>	14.498***	18.688***	4.190	25.713***	31.963***	6.250
	<b>t-Value</b>	4.28	7.90	1.00	5.09	9.66	1.05
	<b>N</b>	(42)	(91)		(42)	(91)	
<b>High GS</b>	<b>Mean</b>	9.855***	14.944***	5.089*	10.375***	25.848***	15.473***
	<b>t-Value</b>	5.16	8.08	1.91	3.86	10.30	4.21
	<b>N</b>	(86)	(96)		(86)	(96)	
<b>Low PPE/TA</b>	<b>Mean</b>	14.404***	17.313***	2.909	20.398***	26.649***	6.251
	<b>t-Value</b>	4.81	7.94	0.76	5.62	9.66	1.30
	<b>N</b>	(46)	(104)		(46)	(104)	
<b>High PPE/TA</b>	<b>Mean</b>	8.016***	12.713***	4.697*	10.754***	27.017***	16.263***
	<b>t-Value</b>	4.20	8.19	1.80	3.08	10.58	3.67
	<b>N</b>	(46)	(98)		(46)	(98)	
<b>Low Sigma</b>	<b>Mean</b>	5.988***	17.567***	11.579***	10.531***	27.322***	16.791***
	<b>t-Value</b>	3.70	8.15	4.29	3.79	10.91	4.49
	<b>N</b>	(75)	(93)		(75)	(93)	
<b>High Sigma</b>	<b>Mean</b>	19.865***	16.166***	-3.699	26.826***	30.682***	3.856
	<b>t-Value</b>	5.82	9.28	0.97	5.36	10.86	0.71
	<b>N</b>	(45)	(106)		(45)	(106)	

**Table 4.6. Effects of Investor Sentiment on Premium and Target's CARs**

This table provides the results of a cross-sectional regression analysis based on the regression equation:

$$Ri-Rm = \alpha + \beta_1 SENTIMENT_i + \beta_2 ControlVariable_{it} \quad (4.3)$$

$$Premium = \alpha + \beta_1 SENTIMENT_i + \beta_2 ControlVariable_{it} \quad (4.4)$$

where  $Ri-Rm$  is the 5-day window abnormal returns to targets. The Premium is measured as:

$$Premium = 100 \times (offer\ price - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. SENTIMENT is a dummy variable for prevailing sentiment, which takes the value of 1 (0), if a monthly sentiment indicator falls into the top (bottom) 20% of those during the entire sample period. ControlVariable includes Multiple Bidder Dummy (Multiple Bidder=1, Single Bidder=0), target's debt to equity ratio (DE), target's free cash flow per share (FCF), target's market to book value (MTBV), target's market value (MV), Transaction Attitude Dummy (Hostile=1, Friendly=0), Cash Dummy (Cash Offer=1, Others=0), Listed Bidder Dummy (Listed Bidder=1, Unlisted Bidder=0). T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Variables</i>	<i>Target's CARs</i>		<i>Sentiment</i>	
	<i>Model (1)</i>		<i>Model (2)</i>	
<b>Constant</b>	0.061	***	9.606	***
	2.88		3.22	
<b>SENTIMENT</b>	0.042	**	9.335	***
	2.25		3.52	
<b>Mutiple Bidders</b>	0.116	***	19.625	***
	3.42		4.1	
<b>DE</b>	-1.00E-04		-0.010	
	-1.56		-1.14	
<b>FCF</b>	-4.00E-04		-0.119	
	-0.67		-1.35	
<b>MTBV</b>	-0.002		-0.384	
	-1.1		-1.22	
<b>MV</b>	-8.07E-06	**	-0.001	**
	-1.78		-2.05	
<b>Attitude Dummy</b>	0.099	***	10.101	**
	3.17		2.29	
<b>Cash Dummy</b>	0.047	**	9.115	***
	2.43		3.34	
<b>Listed Bidder Dummy</b>	0.580	***	7.274	***
	3.07		2.71	
<b>Adj. R-Squared (%)</b>	8.23		10.41	
<b>F</b>	5.62		6.97	
<b>N</b>	464		464	



**Table 4.7. Cross-Sectional Variation in the Role of Sentiment**

This table provides the estimated coefficient of sentiment ( $\beta_1$ ) based on the regression:

$$Ri-Rm = \alpha + \beta_1 SENTIMENT_i + \beta_2 ControlVariable_i \quad (4.3)$$

$$Premium = \alpha + \beta_1 SENTIMENT_i + \beta_2 ControlVariable_i \quad (4.4)$$

These regressions are estimated separately for sub-samples of targets sorted on speculative characteristics. A target falls into the group H (L), if the values of its speculative characteristics fall into the top (bottom) one third of those in the entire sample. The regressants  $Ri-Rm$  is the 5-day window abnormal returns to targets. The Premium is measured as:

$$Premium = 100 \times (offer\ price - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Subsamples</i>		<i>Sentiment Coefficient (<math>\beta_1</math>)</i>			
		<i>CAR(-2,2)</i>		<i>Premium</i>	
		<i>(1)</i>		<i>(2)</i>	
<b>AGE</b>	<b>H</b>	0.081	**	13.634	***
		<i>2.17</i>		<i>2.85</i>	
	<b>L</b>	-0.010		1.265	
		<i>-0.36</i>		<i>0.28</i>	
<b>SIZE</b>	<b>H</b>	0.055	**	7.025	*
		<i>2.14</i>		<i>1.73</i>	
	<b>L</b>	0.033		12.516	**
		<i>0.71</i>		<i>2.05</i>	
<b>DPS</b>	<b>H</b>	0.046		11.547	***
		<i>1.61</i>		<i>2.60</i>	
	<b>L</b>	0.016		7.171	
		<i>0.37</i>		<i>1.04</i>	
<b>EPS</b>	<b>H</b>	0.041		11.026	***
		<i>1.51</i>		<i>2.89</i>	
	<b>L</b>	0.044		7.559	
		<i>1.06</i>		<i>1.20</i>	
<b>PPE/TA</b>	<b>H</b>	0.064	**	17.654	***
		<i>2.23</i>		<i>3.67</i>	
	<b>L</b>	0.045		10.139	**
		<i>1.14</i>		<i>2.14</i>	
<b>GS</b>	<b>H</b>	0.047	*	12.543	***
		<i>1.68</i>		<i>3.35</i>	
	<b>L</b>	0.044		7.727	
		<i>0.94</i>		<i>1.16</i>	
<b>SIGMA</b>	<b>H</b>	-0.029		4.024	
		<i>-0.79</i>		<i>0.70</i>	
	<b>L</b>	0.105	***	13.243	***
		<i>3.70</i>		<i>3.37</i>	

**Table 4.8. Robustness Test: Premium, Target's CARs, Investor Sentiment and Firm Speculative Characteristics**

This table compares takeover premium and targets' short-run returns (CARs) conditional on investor sentiment and firm speculative characteristics. Targets are grouped into high (low) speculation category if the value of their speculative characteristics proxies, including EPS and DPS, are negative/zero (positive).

CAR (-2, 2) is the 5-day window abnormal returns to targets. The premium is measured as:

$$\text{Premium} = 100 \times (\text{offer price} - P_{4w}) / P_{4w} \quad (4.2)$$

Where  $P_{4w}$  is target share price 4 weeks prior to the announcement date. No. of observations are provided in parenthesis. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Speculative Characteristics</i>		<i>Premium</i>		<i>HML</i>	<i>CAR(-2,2)</i>		<i>HML</i>
		<i>Sentiment</i>	<i>Sentiment</i>		<i>Sentiment</i>	<i>Sentiment</i>	
		<i>Group1</i>	<i>Group5</i>	<i>(Group5-Group1)</i>	<i>Group1</i>	<i>Group5</i>	<i>(Group5-Group1)</i>
<b>Positive DPS</b>	<b>Mean</b>	18.070	28.524	10.454***	11.752	16.332	4.58**
	<b>t-Value</b>	8.03	17.68	3.77	7.94	12.82	2.32
	<b>N</b>	(156)	(237)		(156)	(237)	
<b>Negative DPS</b>	<b>Mean</b>	15.990	27.612	11.622	12.280	14.678	2.398
	<b>t-Value</b>	2.23	6.15	1.32	2.58	5.73	0.46
	<b>N</b>	(18)	(54)		(18)	(54)	
<b>Positive EPS</b>	<b>Mean</b>	18.107	28.624	10.517***	11.519	16.835	5.316***
	<b>t-Value</b>	7.92	17.68	3.75	7.91	13.29	2.75
	<b>N</b>	(161)	(264)		(161)	(264)	
<b>Negative EPS</b>	<b>Mean</b>	14.729	26.884	12.155*	15.373	11.594	-3.779
	<b>t-Value</b>	3.07	5.62	1.79	2.70	4.73	-0.69
	<b>N</b>	(13)	(45)		(13)	(45)	

**Table 4.9. Robustness Test: Cross-sectional Sentiment Effects on Premium and Target's CARs**

This table provides the results of a cross-sectional regression analysis based on the regression equations:

$$Ri-Rm = \alpha + \beta_1 SENTIt \times Speculative + \beta_2 SENTIt \times NonSpeculative + \beta_3 CVit \quad (4.5)$$

$$Premium = \alpha + \beta_1 SENTIt \times Speculative + \beta_2 SENTIt \times NonSpeculative + \beta_3 CVit \quad (4.6)$$

Ri-Rm is the 5-day window abnormal returns to targets. The premium is measures as:

$$Premium = 100 \times (offer\ price - P_{4w}) / P_{4w} \quad (4.2)$$

where  $P_{4w}$  is target share price 4 weeks prior to the announcement date.

SENTIMENT is a dummy variable for prevailing sentiment, which takes the value of 1 (0), if a monthly sentiment indicator falls into the top (bottom) 20% of those during the entire sample period. SpeculativeTargets and NonSpeculativeTargets are vectors of dummy variables based on speculative characteristics proxies ((non-)dividend-paying and (non-)profitable); ControlVariable includes Multiple Bidder Dummy (Multiple Bidder=1, Single Bidder=0), target's debt to equity ratio (DE), target's free cash flow per share (FCF), target's market to book value (MTBV), target's market value (MV), Transaction Attitude Dummy (Hostile=1, Friendly=0), Cash Dummy (Cash Offer=1, Others=0), Listed Bidder Dummy (Listed Bidder=1, Unlisted Bidder=0). T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

Variable	CAR5D				Premium			
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
<b>Constant</b>	0.082*** 4.27	0.064*** 3.15	0.084*** 4.39	0.060*** 2.98	14.072*** 5.14	10.945*** 3.77	14.051*** 5.12	10.958*** 3.79
<b>SENTIMENT*ZeroDPS</b>	-0.006 -0.23				1.706 0.43			
<b>SENTIMENT*PositiveDPS</b>		0.040** 2.27				7.619*** 3.03		
<b>SENTIMENT*NegativeEPS</b>			-0.036 -1.21				1.657 0.39	
<b>SENTIMENT*PositiveEPS</b>				0.051*** 2.89				7.857*** 3.10

Table 4.9 continued

<b>Mutiple Bidders</b>	0.124***	0.116***	0.125***	0.115***	21.489***	20.032***	21.462***	20.116***
	3.68	3.45	3.71	3.42	4.46	4.17	4.45	4.20
<b>DE</b>	-1E-04	-1E-04*	-1E-04*	-1E-04*	-0.010	-0.013	-0.010	-0.012
	-1.58	-1.72	-1.68	-1.73	-1.09	-1.36	-1.10	-1.33
<b>FCF</b>	-3E-04	-4E-04	-3E-04	-4E-04	-0.096	-0.113	-0.096	-0.114
	-0.49	-0.64	-0.48	-0.69	-1.08	-1.27	-1.08	-1.28
<b>MTBV</b>	-0.002	-0.002	-0.002	-0.002	-0.399	-0.321	-0.399	-0.316
	-1.07	-0.95	-0.95	-0.90	-1.24	-1.01	-1.24	-1.00
<b>MV</b>	-8E-06*	-9E-06*	-9E-06*	-9E-06*	-0.001**	-0.001**	-0.001**	-0.001**
	-1.84	-1.90	-1.91	-1.90	-2.07	-2.22	-2.07	-2.19
<b>Attitude Dummy</b>	0.084***	0.094***	0.082***	0.098***	7.172	8.772**	7.126	9.023**
	2.74	3.06	2.68	3.19	1.63	2.01	1.63	2.06
<b>Cash Dummy</b>	0.057***	0.050***	0.057***	0.046**	11.058***	9.983***	11.125***	9.642***
	2.97	2.62	3.02	2.42	4.07	3.69	4.11	3.54
<b>Listed Bidder Dummy</b>	0.062***	0.060***	0.061***	0.058***	7.896***	7.761***	7.970***	7.418***
	3.24	3.19	3.24	3.06	2.90	2.89	2.94	2.76
<b>Adj. R-Squared (%)</b>	7.22	5.63	7.51	8.88	8.00	9.78	7.99	9.87
<b>F</b>	5.01***	8.26***	5.18***	6.02***	5.47***	6.58***	5.47***	6.63***
<b>N</b>	464	464	464	464	464	464	464	464

**Chapter 5:**

**Information Asymmetry, Information Contents and Serial**

**Acquisitions**

## 5.1 Introduction

In the previous two empirical chapters, a takeover deal is regarded as a static information dissemination process, which corrects existing information asymmetry surrounding takeover firms. Along this process, the information contents signalled by takeover announcement have been addressed in chapter 3; the sentiment shown by investors in interpreting this information has been considered in chapter 4. Developed upon these two research focuses, the potential influence of information sender on the wealth creation of corporate takeovers requires evaluation. Research development upon previous chapters can also be made by extending this static information dissemination process into a dynamic one. This can be achieved by examining information asymmetry surrounding acquiring firms in takeover series, where a decreasing scale of information dissemination is inherent.

This research focus on information asymmetry along series acquisitions bears some research importance, as the public press has been increasingly sceptical about the performance of frequent acquirers. Specifically, growing concerns have been given to frequent acquirers who are engaging in constant acquisitions rather than organic growth. Companies that are constantly involved in acquisitions, for example Tyco, AutoNation, U.S. Office Products and AT&T, tend to underperform their peers (Henry, 2002). However, some doubts have been cast on the scepticism towards frequent bidders, as frequent acquirers such as Cisco or General Electric have achieved successful integration by frequent acquisitions on a small scale (Stern, 2006).

It seems the mergers and acquisitions industry has provided the business press with various serial acquisition outcomes, from which no commonly held view can be drawn. In the academic field, there are a number of theories which can generate an equally wide range of predictions about the performance of frequent acquirers. These theories include diminishing returns hypothesis, capitalization hypothesis, organizational learning hypothesis, managerial hubris hypothesis, indigestion hypothesis and information asymmetry hypothesis.<sup>65</sup> These theories predict that serial acquisitions may have increasingly positive, or negative, value effects on the performance of acquiring companies.

Contrary to the differing theoretical predictions, relatively consistent empirical evidence is documented in literature. In general, serial acquisitions have a more favorable impact on an acquirer's long-run performance than single acquisitions. This outperformance of frequent bidders is represented by their high long-run returns and improvements in profit margins (e.g., Stegemoller, 2001; Rovit and Lemire, 2003). However, frequent bidders underperform in the short-run compared with casual bidders (e.g., Ismail, 2008); there is a decline in their short-run returns with subsequent mergers (e.g., Schipper and Thompson, 1983; Loderer and Martin, 1990). Additionally, more recent research reports a positive correlation between the similarity in an acquisition series and the frequent acquirers' performance in both short-run and long-run (e.g., Haleblan and Frikelstein, 1999; Fuller *et al.*, 2002).

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<sup>65</sup> For organizational learning hypothesis, see for example, Conn *et al.* (2004) and Aktas *et al.* (2007); for diminishing return hypothesis and indigestion hypothesis, see for example, Conn *et al.* (2004); for capitalization hypothesis and managerial hubris hypothesis, see for example, Ismail (2008).

Although existing theories, including diminishing returns hypothesis, capitalization hypothesis, organizational learning hypothesis, managerial hubris hypothesis and indigestion hypothesis, can be employed to theorize some of the findings on both the differing performance between casual and frequent bidders and on serial returns generated by frequent bidders, none can adequately provide a thorough understanding of frequent acquirers' gains. For instance, managerial hubris hypothesis (Malmendier and Tate, 2004) and indigestion hypothesis (Conn *et al.*, 2004) cannot explain the long-run outperformance of frequent bidders, as they predict the opposite outcomes. Moreover, capitalization hypothesis suggests that no significant return should be seen in subsequent acquisitions, and thus fails to rationalize why frequent bidders' announcement returns remain positive to the fourth bid (Ismail, 2008). Given that the great majority of takeover deals are announced by frequent bidders, the inadequacy of these existing theories highlights the research need in applying a theory which can sufficiently rationalize the performance of frequent bidders and provide a more coherent description of the value effects of serial acquisitions.

A takeover deal is regarded as a static information dissemination process in previous chapters. This static process can be extended into a dynamic one where serial takeover announcements can be treated as a process of a decreasing scale of information dissemination. This is because as more information becomes readily available in the market, there is less information left to be released, through subsequent acquisitions. As discussed in Chapter 3 along the static information dissemination process, the revaluation, based on information released, has some bearing on firms' announcement returns. Accordingly, along a dynamic process, the



changes in this revaluation, based on the continual release of information, are expected to influence frequent bidders' gains.

This conjecture highlights the potential for information asymmetry, in particular changes in information asymmetry, to rationalize the performance of serial acquisitions. Given this, the aforementioned inadequacy of existing theories in providing a coherent description of the value effects of serial acquisitions may possibly be filled by the information asymmetry hypothesis. Information asymmetry has rarely been directly applied to theorize the performance of frequent bidders (see Draper and Paudyal (2008) for one of the few examples). However, the documented implications of information asymmetry on the announcement returns of various corporate events (e.g., Dierkens, 1991; Krishnaswami and Subramaniam, 1999) can shed light on the relevance of Information asymmetry for acquisition series. Given the documented information asymmetry gains that are constantly captured by firms (e.g., Finnerty, 1976; Seyhun, 1986)<sup>66</sup>, it is intuitive to expect that the declining scale of information dissemination, and thus the declining information asymmetry, in an acquisition series should accompany diminishing bidders' gains.

Nevertheless this conjectured decline in gains, generated by decreasing information asymmetry inherent in acquisition series, may not hold across all acquisition types, as information asymmetry gains are conditional on the content of the information. As suggested by Moeller *et al.* (2006), the value effects of information asymmetry are conditional on the information content. More specifically,

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<sup>66</sup> Seyhun (1992) and Jeng *et al.* (1999) report that information advantage can lead to insider gains. Insider trading, although a separate issue, helps in understanding what will happen to stock returns if information is unevenly distributed between market participants.

they point out that for a given distribution of returns, the expected returns conditional on good news increase with an increase in asymmetric information, and those which are conditional on bad news decrease as asymmetric information increases. Given that, in the takeover context, cash (equity) payment is generally interpreted as a positive (negative) signal (Myers and Majluf, 1984; Eckbo *et al.*, 1990), Moeller *et al.* (2006) report that bidders' announcement returns for acquisitions of public firms paid for with equity, decrease as information asymmetry increases. Conversely, abnormal returns for acquisitions of public firms paid for with cash, increase as information asymmetry increases.

These changes in information asymmetry can be quantified within a serial acquisition framework. Accordingly, developed upon the research of Moeller *et al.* (2006), this chapter fills the aforementioned literature gap existing in serial acquisitions,<sup>67</sup> by evaluating the relevance of dynamic information asymmetry to frequent bidders' gains. This research objective is achieved by examining the following research question. *What are the value effects of information asymmetry in serial acquisitions? Is information asymmetry itself, sufficient to explain announcement announcement returns of serial acquisitions?*

Examining these two research questions, is to identify a balance between the effects of information asymmetry and information contents on frequent bidders' gains. Different from the study of Moeller *et al.* (2006), and developed upon the empirical results reported in Chapter 3, the contents of information signalled by takeover

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<sup>67</sup> The literature gap, as previously mentioned, exists in the inadequacy of these extant theories in sufficiently rationalizing the performance of frequent bidders and providing a coherent description of the value effects of serial acquisitions.

announcements is measured by a hybrid of a transaction's payment method and financing source. This is because, in evaluating takeover announcements, investors not only take payment mechanisms into consideration but also extract information from the transaction's financing sources (Schlingemann, 2004). Specifically, both share deals and equity financed cash deals signal negative information to the market, while internal cash and debt financed cash deals send out positive information.

An insight into these questions can further the understanding of the theoretical implications of information asymmetry hypothesis on corporate takeovers by introducing a relation between takeovers and a dynamic information asymmetry. Moreover, it contributes to the understanding of the rationale underlying frequent bidders' performance which, thus far, has been inadequately researched.

The chapter proceeds as follows. Section 2 provides a comprehensive literature review on serial acquisitions and information asymmetry, and further presents the development of hypotheses and testable predictions. Section 3 discusses sample selection and description, and introduces the methodology of measuring information asymmetry. Results from univariate tests and cross-sectional regression analyses are given in Section 4. Section 5 concludes the chapter and points out potential contributions to literature.

## **5.2 Literature Review**

### **5.2.1 Literature Review on Subsequent Acquisitions**

Developed upon fundamental economic theories, for example the law of diminishing returns, several hypotheses have been suggested to shed light on the value creation of frequent bidders. More recent development in behavioural finance adds to the understanding of this issue by introducing the relevance of industrial and managerial behaviour to the value effects of acquisition series. Related literature and documented empirical evidence are reviewed in this subsection.

#### **5.2.1.1 Theoretical Implications**

The law of diminishing returns is a key concept in economics. It states that in a given production system, the marginal physical product of an input will fall as the investment of that input increases. These declining returns can be attributed to market saturation or natural environment limits. This concept, once applied in the takeover context, suggests that, after a certain increase in returns or economic benefits, there will be a moment when the increase in the number of bids cannot improve a firm's investment productivity or efficiency (e.g., Conn et al., 2004; Ismail, 2008).

Due to the learning curve effects and the experience curve effects,<sup>68</sup> in a manufacturing setting, the more often a task is performed the lower the cost of doing it will be. Applying this line of research to a takeover context, the learning hypothesis

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<sup>68</sup> The learning curve effects state, the more often a task is performed, the less time will be required on subsequent repetitions. The experience curve effects suggest, that the more times a task has been performed, the lower the costs incurred in subsequent iterations will be.

postulates that returns from subsequent acquisitions should present an increasing trend, as the experience built up by frequent acquirers will enhance their shareholders' value over time (Aktas *et al.*, 2007).

Variations of the organizational learning hypothesis suggest that the positive effects of learning and experience in the manufacturing context cannot be applied to any other organization experience, for example mergers and acquisitions. This is because manufacturing a product generally follows a standardized practice, where the experience drawn is applied to similar practices; while other organizational activities may not have a standardized practice to follow and thus no similar experience can be drawn (Haleblian and Finkelstein, 1999). Given this dissimilarity, here develops the behavioural learning theory, which regards industrial learning behaviour as the action upon analyzing both present and past environmental influences. The outcome of such a learning behaviour depends on the similarity of the present and past conditions. When a current condition is similar to a previous one, the behavior presented in the previous situation is likely to be generalized to the current situation. This is a beneficial learning process. However, when a current antecedent condition is dissimilar to a previous condition, drawing on past experience may result in detrimental outcomes.

Given that acquisitions are discrete and easily discernible events, organizational learning hypothesis therefore indicates that there are several learning curves to follow, conditional on the type of acquisition (Conn *et al.* 2004). If acquirers tend to only learn from similar experiences, the increasing returns from subsequent acquisitions should exist exclusively in an acquisition series where constituent deals share similar

characteristics. On the other hand, for a series of bids which are of different types, an acquirer's learning from past experience fails to create value for the subsequent bids.

What underlies the organizational learning hypotheses is that managers draw from previous mergers and acquisitions experiences in a rational manner. However, managers may be over-confident in making takeover decisions as suggested by managerial hubris hypothesis (Roll, 1986; Malmendier and Tate, 2004). The success of the initial acquisitions may lead managers to erroneously believe they can constantly create takeover synergies and thus become less careful in choosing targets and determining takeover premium. The consequence of this managerial overconfidence, underlying the decision to merge, is a series of value-destroying acquisitions. Therefore, a decline, instead of an increase, in acquirers' returns is expected for subsequent bids, especially when the initial bid is successful (Ismail, 2008).

Even if managers do rationally learn from past takeover transactions, the benefits of their accumulated experience may not be fully exploited, as a high takeover frequency leaves acquiring firms with little time to 'digest' the synergies created by individual transactions. This indigestion<sup>69</sup> can be shown as an inverse relationship between a frequent acquirer's performance and the number of the acquirer's bids. More specifically, as the number of an acquirer's bids increases, its performance deteriorates (Conn *et al.*, 2004).

In addition to the expected synergies generated by takeovers, revaluations

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<sup>69</sup> Indigestion means the inability of successful integration of subsequent acquisitions, due to the short time period between transactions.

through information dissemination can also influence bidders' value creations. In the presence of information asymmetry, a firm may fail to reveal its true potential to the investment community. An improvement in information dissemination, through takeover announcements, has the potential of drawing the attention of investors. They then reevaluate the firm's existing assets and growth opportunities. Accordingly, compared with bidders surrounded by less severe information asymmetry, acquirers with greater asymmetric information can expect larger absolute changes in their stock returns via revaluations (Draper and Paudyal, 2008).

When developing this line of research in a frequent bidder context, this value enhancement of revaluation via information dissemination is expected to be more evident for casual bidders. This is because frequent bidders, compared with casual bidders, continually disseminate firm information to the market by announcing acquisitions, and hence are exposed to less information asymmetry. Consequently, fewer revaluation effects are generated for these firms. In addition, where exclusively concerned with frequent bidders, the revaluation effects should decrease with a frequent bidder's subsequent bids, since the initial bid is surrounded with greater asymmetric information relative to subsequent bids.

In summary, research efforts towards theorizing the value creations of serial acquisitions have generated a wide range of predictions. These developed hypotheses predict that subsequent acquisitions can have increasingly positive, or negative, effects on the performance of acquiring firms. These theoretical predictions are, in the next subsection, tested against the empirical evidence of frequent bidders' performances.

### **5.2.1.2 Previously Observed Empirical Evidence**

The observed empirical evidence of frequent bidders' gains largely consists of two groups of findings, which concern i) differences in the value effects of takeovers generated for casual and frequent bidders, and ii) changes in frequent bidders' announcement-period returns along their acquisition series.

Firstly, various attempts have been made to examine the differences in announcement returns, long-run returns, and long-run accounting performances between casual bidders and frequent bidders.

Based on a sample of 16,211 US takeovers, announced during the period 1985-2004, Ismail (2008) finds that casual bidders, on average, outperform frequent bidders by 1.66% during announcement periods. This superior short-run performance shown by single bidders is consistent across all subsamples, after the effects of some firm and deal characteristics, such as target public status, geographic scope, industrial scope and payment methods, have been controlled.

Although frequent bidders underperform relative to casual bidders in the short-run, this trend reverses in the long-run. As suggested by Stegemoller (2001), acquisitions announced by frequent acquirers have more favourable impacts on acquirers' long-term performance. This better long-term performance is represented by both higher post-announcement stock returns and improvements in profit margins. Similar findings are reported by Rovit and Lemire (2003), who find acquirers carrying out more than twenty transactions during a 15-year period outperform those who



announce one to four deals. This long-term outperformance of frequent bidders is inconsistent with the predictions of indigestion hypothesis and hubris hypothesis. As suggested by these two hypotheses, frequent bidders' inability to digest potential synergies, or their managerial overconfidence, results in value destroying acquisitions. Accordingly, frequent bidder should underperform, rather than outperform, relative to causal bidders in the long-run.

Secondly, growing research efforts have been made towards examining the changes in frequent bidders' returns along their acquisition series. A decline in short-run returns with subsequent mergers has been widely documented. By examining the announcement returns of 55 firms engaging in acquisition programs from 1952 to 1968, Schipper and Thompson (1983) evaluate the performance changes of frequent acquirers through their subsequent acquisitions. They find that announcing a merger program generates significantly positive returns to the acquirer, but there are insignificant stock price reactions to subsequent merger announcements.

Subsequent studies document similar findings. Loderer and Martin (1990) identify serial acquisitions as a series of transactions starting after and ending with a 2-year non-acquisition hiatus. Compared with subsequent acquisitions, the first bid in an acquisition series leads to significantly larger announcement effects. This subsequent decline in announcement returns support diminishing return and indigestion hypotheses. These two hypotheses suggest that the law of diminishing returns, or frequent bidders' inability to digest created synergies of the combined units, is inherent in an acquisition series; these further give rise to a decline in frequent bidders' gains with subsequent acquisitions.

Furthermore, findings that abnormal returns remain significantly positive through the fourth bid have also been reported by Asquith *et al.* (1983), Malatesta and Thompson (1985) and Ismail (2008). This finding refutes the capitalization hypothesis, which suggests that the market capitalizes the value of subsequent acquisitions when the first deal is announced, and thus predicts that no significant returns should be seen on subsequent acquisitions.

Despite the widely documented declining returns with subsequent bids, counterviews argue that this trend is not generalizable. Furthermore, more recent empirical findings suggest that a frequent bidder's performance is conditional on factors along its acquisition series, including the condition of the first bid, the frequency and similarity between deals.

Ismail (2008) examines the subsequent performance of acquirers with a successful first acquisition. It is found that for acquirers with unsuccessful first acquisitions, their announcement returns exhibit an increasing trend from -7.47% for the first deal to 1.21% for the third deal. These announcement returns remain significantly positive until the fourth bid. Conversely, acquirers with successful initial bids earn 8.15% from the first deal but have lower announcement returns from the second and the third deal (1.86% and 1.61% respectively). The findings that successful (unsuccessful) first bid leads to a decline (increase) in subsequent transactions are in line with the theoretical implications of hubris hypothesis. This hypothesis suggests that acquirers with unsuccessful first bids learn from this experience; while bidders with successful first bids suffer from managerial hubris, in particular managerial overconfidence. This overconfidence leads managers of these

firms to wrongly believe that they can constantly create value for the firms via takeovers, and hence makes them more acquisitive. As a consequence, decreasing returns with their subsequent acquisitions are expected.

Fuller *et al.* (2002) investigate the announcement returns of 539 bidders carrying out at least 5 acquisitions over a 3-year period from 1990 to 2000. They find that the greater the time interval between deals in an acquisition series, the larger the announcement returns. This is in line with indigestion hypothesis, as a longer time period between acquisitions allows a frequent bidder to better digest the synergies created by the combined firm.

However, a 'U' shaped relation, rather than a linear relation, between bidders' gains and takeover frequency is reported by Hayward (2002). He indicates that initially the greater the time difference the larger the announcement returns; however, if the time difference is too large, then the announcement return starts to decrease. The indigestion hypothesis, therefore, does not seem to hold in this non-linear relation.

Haleblian and Finkelstein (1999) investigate similarities between deals in an acquisition series. Concerning the entire sample, they report a significant negative relation between acquisition experience and short-run performance. However, for similar deals (dissimilar deals), bidders' experiences are positively (negatively) related with their long-run and short-run performance. Similar findings are also documented by Conn *et al.* (2004). Organizational learning hypothesis is then used to rationalize these empirical results. As most deals are dissimilar to each other, simply drawing on past experience will give rise to detrimental outcomes. Thus, there is a negative

relation between a frequent bidder's experience and their performances. However, acquirers will benefit from their experience if, in their acquisition series, subsequent bids share similar characteristics with preceding ones.

A summary of all of this empirical evidence on frequent bidders and their theoretical implications are presented in Table 5.1. Although Diminishing returns hypothesis, organizational learning hypothesis, managerial hubris hypothesis and indigestion hypothesis can be employed to theorize some of the findings on performance difference between casual bidders and frequent bidders, and further on serial returns generated by frequent bidders, panel B shows that none can adequately provide a thorough understanding of frequent acquirers' gains. Given this inadequacy, a different theory needs to be applied to provide a more coherent description of frequent bidders' performance. This research need is expected to be achieved by applying theories concerning information asymmetry and information contents. Literature on these two research areas is then reviewed in the following subsection.

### **5.2.2 Information Asymmetry and Information Contents**

Few studies have directly examined the effects of information asymmetry on serial acquisitions. However, abundant literature has investigated the relations between asymmetric information and stock returns and has drawn connections between information asymmetry and the announcement effects of various corporate events. These developed research areas are discussed in the paragraphs below, which can shed light on the relevance of information asymmetry to serial acquisitions.

The asymmetric information between two parties poses potential benefits for the informed group to capture. As in the case of corporate insiders<sup>70</sup>, information asymmetry allows insiders to possess and further trade on information that is not included in the market price. This enables them to identify and exploit share mispricing. Accordingly, information advantage can lead to insider gains.

Such insider gains have been widely acknowledged in existing literature, although estimates of the gains from insider tradings may vary widely. Lakonishok and Lee (2001) report a mild market response of 0.59% around insider tradings. Jaffe (1974), Finnerty (1976) and Seyhun (1986) document significant abnormal stock returns generated by insider tradings in the US market. For a period of 8-month following an intensive trading event, insiders can gain an average return of 5% (Jaffe, 1974). Finnerty (1976) examines insider tradings from January 1969 to December 1972, and reports an average risk-adjusted gain of 4.3% for stock purchasers and 2.2 % for sellers. Similar results are reported by Fowler and Rorke (1984) and Pope *et al.* (1990) concerning the Toronto Stock Exchange and the London Stock Exchange respectively. An overview of these findings indicates that insiders are able to outperform the market and thus there are constantly information asymmetry gains to be captured.

In addition to the effects of information asymmetry on stock returns, information asymmetry also has some bearing on various corporate financing and investment activities. In line with the implication of market timing, Chang *et al.* (2006) document

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<sup>70</sup> Insider trading, although a separate issue, assists in understanding what will happen to stock returns if information is unevenly distributed between market participants. Therefore, literature on insider trading is reviewed to shed light on the valuation effects of information asymmetry.

that firms subject to more information asymmetry have greater incentives and opportunities to incorporate market conditions into their financing decisions. More specifically, firms surrounded by greater information asymmetry will issue equity less frequently. However, when the market conditions are good, these firms issue equities, usually in large amounts, to meet their leverage targets.

The result that firms issue equity more frequently, if their information asymmetry is relatively low, is consistent with the findings of Dierkens (1991). Meanwhile, she provides some other evidence on the relevance of information asymmetry to the equity issue process. More specifically, the cross-sectional tests show that an increase in the information asymmetry surrounding an issue firm intensifies the drop in that firm's share price at the equity issue announcement-period. Additionally, the time-series test suggests that information asymmetry surrounding issue firms decreases after equity issue announcements.

In addition to corporate financing practice, a firm's de-investment, and investment activities, are also exposed to the influences of information asymmetry. Krishnaswami and Subramaniam (1999) investigate the effects of information asymmetry on corporate de-investment activities by testing whether a firm's value is more transparent after a spin-off. Their logic regression analysis provides evidence that firms engaging in spin-offs have a higher degree of information asymmetry compared with other companies. Moreover, as indicated by their paired t-test results, this asymmetry significantly decreases after a spin-off.

The theoretical implications of information asymmetry on a firm's investment

activities, for example mergers and acquisitions, largely surround the payment mechanism of takeover transactions. The stock market reaction to an *ex post* investment decision reflects both the market's uncertainty about the firm's ability to materialize the investment opportunity and whether the financing decision is driven by overvaluation (Myers and Majluf, 1984). As discussed in 2.3.2, an equity payment is generally regarded as a reflection of the acquirer's private information concerning its overvaluation (Myers and Majluf, 1984; Eckbo *et al.*, 1990). Accordingly, this overvaluation is reflected by a negative stock market reaction. Furthermore, external financing is generally considered to be more costly than internal financing, in terms of adverse selection costs and transaction costs. As for external financing, issuing equity is assumed to be more costly than issuing debt (Myers and Majluf, 1984). Therefore, given both the perceived overvaluations and the financing costs associated with equity payments, there are negative stock price reactions at the announcements of share deals. Conversely, cash deals generate positive, or at least higher, announcement returns (Frank *et al.*, 1991; Andrade *et al.*, 2001; Bouwman *et al.*, 2003).

Other than the payment mechanism of takeovers, Draper and Paudyal (2008) provide some insight into the information asymmetry effects on bidders' gains, namely from the perspective of misvaluation. If bidders' gains can be deconstructed into synergies and revaluation gains, information asymmetry has the potential to boost bidders' share prices through a revaluating process. More specifically, if a firm is previously surrounded by severe asymmetric information and fails to reveal its potential to the investment community, the improvement in information dissemination through takeover announcements can draw the attention of investors. Consequently, this generates the opportunity of revaluating the firm's existing assets and growth

opportunities. Therefore, compared with bidders surrounded by less severe information asymmetry, acquirers subjected to greater information asymmetry can expect larger absolute changes in their stock returns via revaluation.

The overview of literature on the relevance of information asymmetry for corporate announcement returns suggests that, in general, a firm's information asymmetry decreases after a corporate event announcement. Furthermore, contrary to the findings on the relations between stock returns and private information, firms do not constantly capture information asymmetry gains at their corporate event announcement periods. For instance, information asymmetry intensifies the drop in issuers' share prices observed at the equity issue announcement-periods. In addition, acquisitions paid with bidders' equities, which present the asymmetric information about the bidders' value, generate negative announcement returns to the acquirers.

These differing stock market reactions, in the presence of information asymmetry, can be explained by information asymmetry gains being conditional on the signalling implications of information released. More specifically, since stock returns are conditional on the nature (positive or negative) of arriving information (Diamond and Verrecchia, 1987), the aforementioned different announcement returns of several corporate financing and investment activities can be attributed to the effects of information contents inherent in these corporate event announcements.

To clarify, “in a rational expectation model with normally distributed returns, the absolute expected return conditional on the sign of the returns increase with volatility of the return (because of Jensen's inequality)” (Moeller *et al.*, 2006, p.3). Based on



this model, expected returns conditional on bad news should be negative for more volatile stocks, and the expected returns conditional on good news should be more positive for these stocks (Diamond and Verrecchia, 1987). Since stock return volatility is regarded as a proxy of information asymmetry,<sup>71</sup> this prediction can be interpreted as the expected returns conditional on bad news being negative for firms with a higher level of information asymmetry, and the expected returns conditional on good news being more positive for these firms.

The understanding of this relevance of information contents to stock returns is furthered by Moeller *et al.* (2006). After taking the payment mechanism and the target public status into consideration, they report that bidders' announcement returns, for acquisitions of public firms paid for with equity, decrease as information asymmetry increases. Conversely, abnormal returns for acquisitions of public firms paid for with cash increase as information asymmetry increases. These findings are attributable to the information contents signalled by takeover deals. When a firm makes a cash offer, the market infers that the firm's equity is worth more than its market value, which is good news for the market and hence leads to higher abnormal returns. Conversely, the announcement of a share deal for a public target, signals to the market that the bidder's management believes the firm's common stock is overvalued, which is negative news.

In general, literature on the relevance of private information to insider gains suggests that information advantage can always generate benefits to the informed party. However, according to corporate finance literature, the unevenly distributed

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<sup>71</sup> For extensive discussion on the rationalization underlying the use of stock return volatility as a measurement of information asymmetry see section 5.3.2.

information between a firm and its outside investors does not constantly generate positive announcement returns to the firm. The reason why a firm's information advantage does not necessarily lead to benefits is that the effects of information asymmetry on a firm's announcement returns are conditional on information content signalled by the announcements. This relevance of information asymmetry and information contents to corporate announcement returns is then applied to a context of acquisition series in the following subsection, upon which the hypotheses of this study are developed.

### **5.2.3 Hypotheses Development**

Information asymmetry has rarely been applied to theorize the performance of frequent bidders. However, the documented implications of information asymmetry on the announcement returns of various corporate events can shed light on the relevance of information asymmetry to corporate takeover series.

Since a firm's information asymmetry generally decreases after corporate event announcements (see Dierkens, 1991 for equity issue; see Krishnaswami and Subramaniam, 1999 for corporate spin-offs), takeover announcements, as a process of information dissemination, have the potential to lower the information asymmetry between acquiring firms and outside investors. Compared with casual bidders, frequent bidders engage more often in releasing firm information to the market, and thus are expected to have lower information asymmetry. In a similar manner, information asymmetry should decrease with subsequent bids in a merger series due to the growing amount of information becoming readily available in the market. In

summary, it is predicted that:

Hypothesis (1): Takeover announcements reduce information asymmetry between acquiring firms and outside investors through information dissemination.

If Hypothesis (1) stands, then it is expected that:

Testable Prediction (1): Information asymmetry surrounding acquiring firms falls after takeover announcements.

Testable Prediction (2): Information asymmetry surrounding acquiring firms decreases with subsequent bids in an acquisition series.

If empirical results lend support to the assumption that takeover announcements reduce information asymmetry between acquiring firms and outside investors (Hypothesis (1)), then a process of declining asymmetric information is inherent in serial acquisitions. This further provides a dynamic context to examine whether the value effects of information asymmetry are conditional on information contents or not. If there are constant information asymmetry gains to capture as shown by the relation between stock returns and private information (Seyhun, 1992; Jeng *et al.*, 1999), then the second hypothesis is expected:

Hypothesis (2)A: Both casual and frequent bidders can constantly capture information asymmetry gains.

This constant asymmetric information gain suggests that information asymmetry generates gains to acquiring firms, regardless of the information content. Therefore, in the context of serial acquisitions, it is expected:

Testable Predication (3): Casual bidders have higher announcement returns than

frequent bidders.

Testable Predication (4): For frequent bidders, their gains decrease with subsequent bids in their respective acquisition series.

However, if, besides the information asymmetry itself, the content of information also matters, the above predicted effects of information asymmetry should not hold across all transactions. As suggested by Moeller *et al.* (2006), for a given distribution of returns, the expected returns conditional on good news increase as asymmetric information increases, while those conditional on bad news decrease as asymmetric information increases. Therefore, deal characteristics (such as payment methods and transaction financing source) that convey information to the market should collaborate with information asymmetry in explaining announcement returns generated by acquisition series. More specifically, debt or internal cash flow financed cash deals should generate diminishing announcement returns in an acquisition series, as returns conditional on good news decrease with declining information asymmetry. On the other hand, equity paid or equity financed cash deals should expected increasing, or at least non-decreasing, announcement returns in an acquisition series, as returns conditional on bad news increase with a declining information asymmetry.

Consequently, against the aforementioned null hypothesis (Hypothesis (2)A), here arises the alternative hypothesis:

Hypothesis (2)B: The relevance of information asymmetry to the value creation of acquisition series is conditional on the information content signalled by takeover announcements.

This alternative hypothesis, that the value effects of information asymmetry are

conditional on the information content, indicates that:

Testable Prediction (5): For frequent bidders, the declining returns in an acquisition series are exclusive to debt or internal cash flow financed cash deals.

Testable Prediction (6): For frequent bidders, equity paid or equity financed cash deals generate increasing, or at least non-decreasing, returns in an acquisition series.

### **5.3 Data and Methodology**

#### **5.3.1 Sample Selection and Description**

Merger and acquisition data is collected from Thomson Financial for the period of 01/01/1985 to 31/12/2007. The following sample selection criteria are then applied to these observations.

- (1) Acquirers are listed for trading on the UK stock market, namely LSE, AIM, USM and London Tech. The value of a deal announced by an acquirer is no less than £1mil. 18,615 bids survive these criteria.
- (2) In order to match SDC data with acquiring firms' share performances and accounting information, DataStream code are required. A minimum size criterion that a bidder's DataStream market value one month prior to announcement is more than £1mil reduces the sample size to 14,775.

- (3) To control the toehold effects and to exclude economically insignificant deals, only acquires who have less than 50% holding of the targets before announcements and acquire more than 50% of targets' shares are included, which excludes 3904 observations.
- (4) A merger series of a firm is identified by deals announced by the firm during a 36-month rolling period prior to an announcement date. The order (rank) of a transaction in a merger series is determined by the number of bids in the prior 36-month. The first transaction in a merger series is then classified as a casual bidder or the 1<sup>st</sup> order bid of a frequent bidder. Since bids announced between January 1985 and November 1987 are used to identify the merger series of acquisitions announced in December 1987, takeovers during January 1985 to November 1987 are excluded from the sample. This last criterion generates a final sample consisting of 10556 observations.

Descriptive statistics are presented in Table 5.2, where observations fall into 10 categories according to their ranks in their respective merger series. As shown in column 2 of Table 5.2, there are 2865 casual bidders and '1<sup>st</sup> order bids' of frequent bidders, which corresponds to 7691 '2<sup>nd</sup> and higher order bids' announced by frequent bidders. Out of the 10556 observation, 35.87% bids are ranked as the 2<sup>nd</sup> or 3<sup>rd</sup> in a merger series. This ratio highlights the salient feature of UK bidders, namely that they tend to be moderately acquisitive<sup>72</sup>, which is consistent with the findings of Conn *et al.* (2004).

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<sup>72</sup> Conn *et al.* (2004) identify moderately acquisitive bidders as bidders announced 2 or 3 acquisitions and highly acquisitive bidders as bidders announced more than 3 acquisitions.

Column 5 and 6 show a clear trend of declining announcement returns with subsequent bids in a merger series regardless of the duration of the event window used. These declining announcement returns coexist with decreasing time intervals and increasing bidders' size (measured by their capitalization). The decrease in time intervals along acquisition series suggest that, acquiring firms have an ever decreasing time to 'digest' the synergies with subsequent acquisitions. The increasing bidders' size, which is a commonly used proxy for information asymmetry, implies that information asymmetries surrounding acquiring firms decrease with subsequent bids.<sup>73</sup> Hence, the coexistence of these three trends is a preliminary result lending support to indigestion hypothesis and information asymmetry hypothesis.

The information asymmetry examined in this study lies between acquiring firms and outside investors. In addition to this setting, information is also unevenly distributed between acquirers and targets. Such unevenly distributed information can be intensified by some deal characteristics, including acquisitions of private targets, cross-border acquisitions and industrial diversified acquisitions. These deal characteristics have some bearing on the value effects of mergers and acquisitions in light of related information asymmetry. For example, acquiring unlisted targets generates higher returns than listed-target acquisitions, because acquisitions of listed targets are relatively more predictable and thus the gains for firms acquiring listed targets would more likely be anticipated and reflected in stock price before their takeover announcements (Faccio et al, 2006). The outperformance of domestic

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<sup>73</sup> Although a decrease in MV in a takeover series can be a direct consequence of continually acquiring new businesses, a bidder's size (MV) still has some bearing on measuring the changes in information asymmetry surrounding the bidder with subsequent acquisitions. This is because both completed and withdrawn transactions are included in the sample, which means an increase in a bidder's MV does not always arise from an increased capitalization from acquiring a new entity. Moreover, rigorous tests on changes in information asymmetry along an acquisition series are presented in 5.4.1.; the results from which show that information asymmetry surrounding a frequent bidder decreases with subsequent bids.

acquisitions over cross-border acquisitions can be attributed to the imperfect information in evaluating overseas targets and the difficulties in international post-merger integrations (Conne *et al.*, 2005). In a similar manner, an industrial diversification exposes bidders to higher informational imperfections, concerning target firms and the resultant units, compared with industry-focused transactions.

Accordingly, the sample is further partitioned into subsamples according to target public status, target domicile, industrial diversification and payment financing methods to control the effects of information asymmetry existing between bidders and targets. Public targets are denoted as listed firms, while private and subsidiary targets are denoted as unlisted firms. Acquisitions announced by bidding firms who share the same 3-digit SIC code as their targets are referred to as related transactions. Equity financed cash deals are cash deals with new equity issues 12 month prior to takeover announcements; non-equity financed cash deals are those without new equity issues.

Table 5.3 shows that the observed changes in bidders' announcement returns and bidders' size along an acquisition series (as in Table 5.2) still hold when the sample is segregated according to various firm and deal characteristics which present information asymmetry between acquirers and targets. More specifically, compared with casual bidders, frequent bidders are subject to less severe information asymmetry (shown by a higher MV) and capture lower announcement returns (shown by a lower CAR3D or CAR5D).

Additionally, as shown in the second column of Table 5.3, the great majority of UK deals involve acquiring unlisted targets. Moreover, UK deals are more likely to be



concentrated in a geographic scope and diversified in an industrial scope. Panel B and C evaluate differences in these deal characteristics between casual and frequent bidders. Compared with casual bidders, frequent bidders are more likely to acquire unlisted targets (92.19% of the bids are unlisted targets acquisitions) and to diversify their industrial and geographic scope. Specifically, cross-border and unrelated industry acquisitions constitute 40.47% and 74.96% of the bids announced by frequent bidders, corresponding to 33.46% and 72.75% for casual bidders.<sup>74</sup>

These high levels of industrial and geographic diversifications represent the existence of dissimilarities between deals announced by frequent bidders. According to organizational learning hypothesis (Conn *et al.*, 2004), these dissimilarities indicate the inability of acquirer to successfully draw on past experience, since acquirers tend to learn only from similar experiences. Thus, detrimental outcomes, at least non-increasing returns from subsequent acquisitions, are expected. These predicted announcement returns by the organizational learning hypothesis are consistent with the findings reported in this study (as shown in Table 5.3). This thus lends preliminary support to the organizational learning hypothesis.

In summary, the descriptive statistics in Table 5.2 and 5.3 support the predictions of information asymmetry hypothesis, but they seem also to be consistent with the

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<sup>74</sup> As shown in panel A-C of Table 5.3, announcement returns to share deals are not significantly different from 0, while returns to non-equity financed cash deals and equity financed cash deals are all statistically significant. The mean values of these share deals, however, are on the whole higher than those of others. For example, 3-day announcement returns generated by share deals are on average 4.197%, corresponding to 0.991% and 0.847% for equity and non-equity financed cash deals respectively. The reason why higher returns are insignificant and lower returns are significant can be due to different standard deviation. Compared with other deals, share deals have a higher standard deviation with large outliers. For instance, 3-day announcement returns to share deals range from -0.444 to 15.366 with a standard deviation of 0.632; returns to equity financed cash deals range from -0.208 to 0.342 with a standard deviation of 0.052.

theoretical implications of indigestion hypothesis and organizational learning hypothesis. Univariate tests and cross-sectional regression analyses based on the following methodologies are carried out in section 5.4, the results from which can be used to test against these theoretical predictions.

### **5.3.2 Information Asymmetries Measurements**

To examine the difference in information asymmetry between pre- and post-takeover announcements and further to value information asymmetry gains, information asymmetry needs to be quantified. This asymmetry is measured based on the principle that managers and outside investors have different access to information. More specifically, managers and investors have equal exposure to the market-wide information and thus the same market-wide uncertainties; however, managers may hold firm-specific information which is unknown to the market. This firm-specific information will eventually be transferred to the market, for example through information releasing events. However, the market bears certain firm-specific uncertainties even before the release of such information. Therefore, a firm's information asymmetry corresponds to only a subset of the total uncertainties surrounding the firm, which is measured as the total uncertainties of the firm corrected for the market-wide uncertainties (Dierkens, 1991).

Based on this rationale, Dierkens (1991) introduced a market-adjusted residual variance (standard deviation) of daily stock abnormal returns as an information asymmetry proxy. Since then, this measurement has been widely used in succeeding literature (e.g., Krishnaswami and Subramaniam, 1999; Moeller *et al.*, 2004b & 2006;

Alexandridis *et al.*, 2008). Compared with other asymmetric information proxies which reflect numerous firm size attributes, for example analysts' coverage, idiosyncratic volatility (Sigma) is less likely to be exposed to this size noise. In this study, Sigma is calculated as the standard deviation of market adjusted residuals of a bidder's daily stock returns measured during the period (t-205, t-6) where t is the acquisition announcement day.

However, the use of idiosyncratic volatility is disputable. As pointed out by Dierkens (1991), it may undervalue the size of uncertainties surrounding a firm shared by the managers of the firm and the market. Hence, it can attribute a higher percentage of the total uncertainties to information asymmetry.<sup>75</sup> Since information asymmetry of a firm is not only determined by the characteristics of the firm's assets, but also influenced by the behavior of the market, it is necessary to take the information environment surrounding the firm into consideration. Firm size, analysts' coverage and trade volume are therefore included to be used jointly with Sigma.

Freeman's (1987) differential information hypothesis suggests that information about large firms is more readily available in the market than information concerning small firms. This is attributable to large firm's institutional ownership or strong market presence.<sup>76</sup> Therefore, outside investors are expected to be better informed about large firms compared with small firms. Following Draper and Paudyal (2008), a

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<sup>75</sup> Dierkens (1991) claims that the uncertainty about industry developments may be included in idiosyncratic volatility, but this uncertainty is likely to be shared by the managers of the firm and the market. Therefore, this proxy may include a higher percentage of the total uncertainty of the firm than being a perfect measure of information asymmetry.

<sup>76</sup> As indicated by Draper and Paudyal (2008), in general, large companies are owned by institutional investors, which make monitoring these companies more cost-effective. Moreover, they have sufficient funds to maintain their public presence via different media. Both of these factors can contribute to a low information asymmetry surrounding large firms.

bidder's size (MV) is measured as the market capitalization of the bidder 10 days prior to an announcement date.

Analysts disseminate firm information to the market and their buy/sell recommendations represent a primary source of information for individual investors (Marcus and Wallace, 1991). In addition to the information distribution role of security analysts, they are engaged in monitoring activities by addressing the agency problems within companies, and further reducing information asymmetry surrounding the firm (Jensen and Meckling, 1976). Therefore, firms under substantial analyst coverage are expected to have a lower degree of information asymmetry between managers and outside investors; firms followed by few analysts are more likely to be plagued by information asymmetry. Accordingly, the number of analysts following a firm has been used as a generally accepted proxy (Doukas *et al.*, 2005; Draper and Paudyal, 2008). Analysts' coverage (F1NE) is measured by the number of analysts, reporting a bidder's EPS forecasts for the forthcoming fiscal year to I/B/E/S, in the month prior to a takeover announcement day.

Trading volume of a firm's share is another measure of asymmetric information often suggested in literature (e.g., Chari *et al.*, 1988; Dierkens, 1991; Draper and Paudyal, 1999). The rationale underlying the use of this proxy is that trading activities bring information to the market. Specifically, when there is a high trading intensity of a firm's shares, more information about the firm may be included in the firm's market value and information asymmetry surrounding the firm will be lower after the time-lag. In order to control size effects, the total trading volume of a firm's shares is scaled by the firm's size in this study. This proxy measures the trading intensity of the firm's

shares. It is calculated as the average number of a bidder's shares traded during the month prior to a takeover announcement day, divided by the number of the bidder's shares outstanding (VO/NOSH).

### **5.3.3 Information Contents Materialization**

Developed upon the empirical findings of the first empirical chapter, information contents are represented by a hybrid of a transaction's payment method and financing source. Although there is an inability to link a pound raised to a pound spend in takeovers, an approximate relation between a transaction and its equity financing source can be created by measuring transaction financing with pre-takeover equity issues (Baker and Wurgler, 2002; Schlingemann, 2004).

Consistent with the methodology employed in Chapter 3, acquirers' new equity issues, held in SDC New Issue database, 1 year prior to acquisitions are employed as a proxy of equity financing. Accordingly, all observations are classified into the following four groups: share deals, equity financed cash deals, non-equity financed cash deals and mixed deals.

## **5.4 Empirical Evidence**

### **5.4.1 Dynamic Information Asymmetry in Serial Acquisitions**

This study examines the relevance of information asymmetry to the value effects of acquisition series. This relevance is based on the assumption (Hypothesis (1)) that

takeover announcements reduce information asymmetry between acquiring firms and outside investors through information dissemination. In testing this hypothesis, pre- and post-bid information asymmetry surrounding acquiring firms are compared. Further, changes in information asymmetry surrounding an acquirer along this firm's acquisition series are then examined. Results from these two univariate tests are reported in this subsection.

#### **5.4.1.1 Pre- and Post-bid Information Asymmetries**

Testing Hypothesis (1) starts with examining whether information asymmetry, surrounding an acquirer, falls after a takeover announcement (Testable Prediction (1)). Related results are presented in this subsection. As discussed above, information asymmetry is quantified by stock idiosyncratic volatility (Sigma), analyst coverage (FINE), firm size (MV) and trading volume (VO/NOSH). Therefore, pre-bid (post-bid) Sigma is calculated as the standard deviation of market adjusted residuals of a bidder's daily stock returns measured during the period  $(t+6, t+205)$   $((t-205, t-6))$  where  $t$  is the acquisition announcement day. Pre-bid (Post-bid) FINE is measured by the number of analysts, reporting a bidder's EPS forecast for the forthcoming fiscal year to I/B/E/S, in the month before (after) the bidder's takeover announcement day. Pre-bid (Post-bid) MV is measured as the market capitalization of a bidder 10 days prior to (after) the announcement date.<sup>77</sup> Pre-bid (Post-bid) VO/NOSH is the average number of a bidder's shares traded during the month ending before (after) the takeover announcement divided by the number of the bidder's shares outstanding. These

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<sup>77</sup> Although an increase in MV after a takeover announcement can be a direct consequence of acquiring a new business, a bidder's size is still included to examine the changes in information asymmetry surrounding the bidder after an announcement. This is because the date announced is not the same as the date effective in most cases and hence the post-bid MV can still have some bearing on measuring information asymmetry surrounding the bidder after its takeover announcement.

post-bid information asymmetry proxies are compared with their corresponding pre-bid values. The paired differences, calculated as ‘post-announcement IA minus pre-announcement IA’ are reported in Table 5.4.

As shown in the last three rows of panel A in Table 5.4, the paired differences are significantly positive for MV, VO/NOSH, and F1NE, indicating a dramatic increase in the value of these proxies after takeover announcements (by 19.34, 0.0005, and 0.029 respectively). Since small firm size, low trading volume and low analyst coverage are regarded as signs of excessive information asymmetry, the growth in MV, VO/NOSH and F1NE after takeover announcements suggests a consequent fall in information asymmetry surrounding acquiring firms. Meanwhile, Sigma decreases by 0.009, revealing a drop in uncertainty and information asymmetry surrounding acquiring firms after takeover announcements.

Panel B and C of Table 5.3 partition the entire sample into acquisitions of listed and unlisted targets, in order to control the asymmetric information between bidders and targets. The reported declining information asymmetry for the entire sample still holds for transactions acquiring unlisted targets, regardless of which information asymmetry proxy is used. For listed target acquisitions, information asymmetry is alleviated after takeover announcements, when it is quantified by VO/NOSH and Sigma.

These empirical results lend support to Hypothesis (1) and Testable Prediction (1), which suggests that the information dissemination, inherent in takeover announcements, has the potential to lower information asymmetry between managers

of acquiring firms and outside investors. Furthermore, the results are consistent with the findings concerning other corporate events, for example equity issue and spin-offs, where a firm's information asymmetry generally decreases after its corporate event announcements (Dierkens, 1991; Krishnaswami and Subramaniam, 1999).

#### **5.4.1.2 Information Asymmetry with Subsequent Bids**

Having suggested that a takeover announcement disseminates new firm information to the market and hence lowers information asymmetry surrounding an acquiring firm, it is then expected that information asymmetry should decrease with subsequent bids in an acquisition series (Testable Prediction (2)).

Table 5.5 evaluates this prediction. Columns 2 to 6 in panel A present a monotonically declining trend in information asymmetry from the 1<sup>st</sup> bid in an acquisition series to bids ranked as 6<sup>th</sup> or more. This trend is quantified by an increase in FINE from 5.576 to 9.2273, a rise in MV from 709.8392 to 2413.16, a growth in VO/NOSH from 0.0036 to 0.0046 and a decrease in Sigma from 0.266 to 0.018.

In panel B, paired t-tests on information asymmetry surrounding acquiring firms between subsequent bids are reported. As shown in columns 2 to 6, in most cases, differences in this information asymmetry between higher ranked bids and the 1<sup>st</sup> order bid are significant. The only exception is found in VO/NOSH between the 1<sup>st</sup> order, and 2<sup>nd</sup> & higher order bids.

Overall, these two groups of results, reported in subsections 5.4.1.1 and 5.4.1.2,



show that information asymmetry, between acquiring firms and outside investors, is significantly higher for the initial bid than subsequent bids. Further, this asymmetry, in general, consistently decreases with subsequent acquisitions. Accordingly, Hypothesis (1) and Testable Prediction (2) are supported.

An overview of these results reveals that, through information dissemination, information asymmetry surrounding an acquiring firm decreases after the firm's takeover announcement. If the firm is a frequent bidder, its information asymmetry, in general, declines gradually and constantly with subsequent acquisitions. Therefore, a process of declining information asymmetry is inherent in serial acquisitions to some extent. This change in information asymmetry along an acquisition series forms the framework in which the value effects of information asymmetry can be examined. Related results are presented in the following subsection.

#### **5.4.2 Bidders' Gains, Dynamic Information Asymmetry and Information Contents**

The above reported results from testing Hypothesis (1) suggest that takeover announcements reduce the information asymmetry surrounding acquiring firms. Further, this information asymmetry on the whole decreases with subsequent bids in an acquisition series. These results form the fundamental basis on which the relevance of information asymmetry, and information content, to the value effects of serial acquisitions can be examined. In doing so, Hypotheses (2)A and Hypotheses (2)B are tested in this subsection.

Bidders' gains along their respective acquisition series are reported in the last two columns of Table 5.5. As shown, there is a continuing decrease in bidders' announcement returns, which follows a similar pattern to changes in information asymmetry, along the acquisition series, with the only exception being the 10<sup>th</sup> and higher order bid. Specifically, as a transaction in an acquisition series moves from the 1<sup>st</sup> order (or casual bidders) to the 9<sup>th</sup> and higher order, bidders' 3-day cumulative abnormal returns decrease from 2.0254% to 0.1385% and their 5-day cumulative abnormal returns decline gradually from 2.1909% to 0.1966%. To evaluate the significance of these changes, paired t-tests on bidders' gains between subsequent bids are implemented. As reported in panel B, all of the paired differences are significantly positive.

The outperformance of single bidders compared with frequent bidders is in line with the empirical results of Ismail (2008). Further, the decline in bidders' announcement returns along their respective takeover series is consistent with the widely documented decreasing short-run returns with subsequent acquisitions (e.g., Schipper and Thompson, 1983; Loderer and Martin, 1990 for the US market; Draper and Paudyal, 2008 for the UK market).

In addition, similar to US frequent bidders, who capture significantly positive announcement returns till the 4<sup>th</sup> bid in their respective acquisition series (e.g., Asquith *et al.*, 1983; Malatesta and Thompson, 1985; Ismail, 2008), UK frequent bidders also benefit from being moderately acquisitive. However, even extremely acquisitive UK acquirers still gain. Unlike their US counterparts, the announcement returns of extremely acquisitive UK bidders remain positive after the 4<sup>th</sup> bid in an acquisition

series. The inconsistency can be attributed to the high frequency of using cash in acquiring targets shown by UK bidders.<sup>78</sup>

Overall the reported empirical results reveal that declining information asymmetry in an acquisition series is accompanied by diminishing bidders' gains. However, it does not necessarily regard information asymmetry as the sole driving force of frequent bidders' gains, which is unrelated to information content. In order to test the potential influence of information contents (Hypothesis (2)), the relevance of information asymmetry to serial acquisitions needs to be examined for subsamples partitioned by the nature (positive or negative) of information content signalled by acquisition announcements.

Hypotheses (2)A and (2)B are then tested on subsamples with different payment financing methods, which present the information content signalled by takeover announcements. Table 5.6 reports changes in short-run returns along an acquisition series for equity-paid offers, equity financed cash deals and non-equity financed cash deals respectively.

Columns 2 and 3 in panel A present changes in announcement returns with subsequent bids when share deals are announced. Differences in announcement returns between the first- and higher order-bids in an acquisition series are shown in Panel B. The reported decreasing returns with subsequent bids for the entire sample cannot be applied here, as almost none of the pair-wised differences are significant. It implies that the value-enhancing effects of information asymmetry do not exist in the

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<sup>78</sup> Abundant studies have documented the positive stock return associated with cash deals. For a literature review on this specific area, see section 2.3.2.

context of share deals. Specifically, although information asymmetry surrounding an equity bidder decreases with subsequent bids, this declining information asymmetry is not accompanied by decreasing information asymmetry gains (bidders' announcement returns).

Results for subsamples of equity financed cash deals are reported in columns 4 and 5. As shown in panel A, there is no constantly monotonic decrease in bidders' gains as bid order increases from the 1<sup>st</sup> order bid to the 10<sup>th</sup> and higher order bids. However, as shown by most of the pair-wised differences, the first bid generates significantly higher returns than higher order bids.<sup>79</sup>

With regards to non-equity financed cash deals, as shown in columns 6 and 7, bidders' announcement returns decrease more monotonically, compared with equity financed cash deals. Their returns decline constantly until the 6<sup>th</sup> and higher order bids. In addition, most of the '1<sup>st</sup> minus higher order bids' values are significantly positive. These results indicate that, in most cases, value effects of information asymmetry are higher for the 1<sup>st</sup> order bid than subsequent bids, where the 1<sup>st</sup> order bid corresponds to a relatively high degree of information asymmetry.

A collective view of these results, on frequent bidders' gains for subsamples that convey different information contents, rejects Hypothesis (2)A and accepts Hypothesis (2)B. Specifically, the relevance of information asymmetry to announcement returns generated by acquisitions series is inconsistent within different acquisition announcements, which signals differing information contents. A declining information

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<sup>79</sup> A cross-sectional regression analysis on equity financed cash deals shows that subsequent bids actually outperform initial bid. See section 5.5.3 for details.

asymmetry surrounding acquirers is inherent in their respective acquisition series. In these series, debt or internal cash flow financed cash deals (positive information content) generally exhibit declining returns, while this pattern is not evident for share deals or equity financed cash deals (negative information content). These findings support Testable Predictions (5) and (6) and oppose Testable Predictions (3) and (4).

These empirical results are in line with the findings of Moeller *et al.* (2006). They claim that for a given distribution of returns, the expected returns conditional on good news increase as asymmetric information increases and those conditional on bad news decrease as asymmetric information increases. These results further suggest that information content signalled by payment financing methods collaborate with information asymmetry in explaining frequent bidders' performance around takeover announcement periods.

Takeover announcements release firm information to the market. With the arrival of new information, investors update their evaluations of the acquiring firms. This revaluation, together with estimated synergies of the resultant units, determines bidders' announcement returns. The scale of this revaluation is influenced by the information environment of the firm concerned. Less-covered companies subject to severe information asymmetry are given more value corrections around their takeover announcement periods. On the other hand, the direction of this revaluation largely depends on the information content.<sup>80</sup> Releasing good (bad) news to the market has the potential of driving up (down) a firm's share price. Investors regard non-equity

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<sup>80</sup> Another determinant of the direction of investor revaluation is firm misvaluation. As reported in Chapter 3, previous undervalued (overvalued) firms are in general associated with positive (negative) value corrections.

financed cash deals (share deals and equity financed cash deals) as positive (negative) signals and assign more (less) value to the acquiring firms. This generates an upward (non-upward) revaluation effect.

Therefore, in a merger series, the scale of investor revaluation should constantly decrease because of the declining information asymmetry with subsequent bids. Frequent acquirers announcing non-equity financed cash deals should expect their upward revaluations to decrease with subsequent takeover announcements. Consequently, serial non-equity financed cash deals should generate declining announcement returns. Conversely, serial equity financed cash deals and share deals should generate non-declining announcement returns, as their non-upward revaluations decrease with subsequent offers.

### 5.4.3 Cross-sectional Regression Analysis

The aforementioned univariate test results suggest that the value effects of information asymmetry on corporate takeover series are conditional on information contents. These univariate test results are then examined for consistency by applying cross-sectional regression analyses to the entire sample and subsamples that convey different information contents. The regression analysis is based on estimating the following regression equation:

$$R_i - R_m = \alpha + \beta_1 \text{Frequent Bidder} + \beta_2 \text{Bid Order} + \beta_3 \text{Time Interval} + \beta_4 X + \beta_5 Z + \beta_6 \text{Control Variable} \quad (5.1)$$

In equation (5.1), the regressand is the bidders' 5-day accumulative abnormal

returns based on a market-adjusted model. Frequent Bidder is a dummy variable, which takes the value of 1 (0), if the acquirer is a frequent (casual) bidder. Bid Order is the order of a deal in an acquisition series. Time Interval is the time difference between bids in an acquisition series measured by days. The vector of explanatory variables  $X$  consist of proxies of bidders' information asymmetry measured by market capitalization (MV), number of analysts following (F1NE), trading volume (VO/NOSH) and return volatility (Sigma). Another vector of explanatory variables  $Z$  present the information content signalled by a takeover announcement, including Non-equity Financed Cash Deals (non-equity financed cash deals=1) and Share Deals (share deals=1). Control Variable are factors which are suggested to be related to acquirer's performance, including Relative Size (deal value divided by the bidder's market value), Target Status (listed targets=1), Target's Domicile (cross border transactions=1), Industrial Diversification (cross industry transactions=1).

The regression analysis begins with estimating the regression model (as in Equation (2)) with selected information asymmetry proxies. To control the correlation between explanatory information asymmetry variables, which may underestimate the explanatory power of these factors, only one proxy presenting the information uncertainty of a firm (SIGMA) and one proxy measuring information environment of the firm (MV, F1NE or VO/NOSH) are included in models (1) – (3). All information asymmetry proxies are included in model (4).

Following the regression equation (5.1), bidders' announcement returns over a 5-day event window are regressed on Frequent Bidder, Bid Order, Time Interval, Information Asymmetry and Control Variables for subsamples that are expected to

signal different information (i.e. equity financed cash deals, non-equity financed cash deals and share deals). Estimations are reported in Table 5.7.<sup>81</sup>

Hypothesis (2)B suggests that the relevance of information asymmetry to the value creation of acquisition series, largely depends on the information content signalled by these acquisition announcements. Testing this hypothesis, is to examine whether the coefficients of Frequent Bidder and Bid Order remain significantly negative for both a subsample conveying negative information (equity financed cash deals and share deals) and a subsample conveying positive information (non-equity financed cash deals).<sup>82</sup>

As shown in Table 5.7 panel B, for non-equity financed cash deals, the coefficients of Frequent Bidder and Bid Order estimated by model (2) are -0.014 and -0.0006 respectively, and both of them are significant. If model (3) is applied, the coefficient of Frequent Bidder (-0.0132) remains significantly negative. These estimations suggest that acquisition announcements, which are interpreted as positive

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<sup>81</sup> Table 5.7 also reports estimations for the entire sample. As shown in Panel A, there is a significantly negative coefficient of Frequent Bidders after factors having potential influence on bidders' announcement returns have been controlled, regardless of which model is used. The coefficient of Bid Order is significantly negative at a value of -0.0006 and -0.0007 respectively when models (2) & (3) are used for estimation. These negative relations suggest that the acquisitiveness exhibited by bidders, drives the stock market response towards takeover announcements in the opposite direction, which is consistent with the empirical findings specified in section 5.5.2. In addition, information asymmetry, measured by Sigma and FINE, generates significant gains for acquires. In unreported results, a -0.0004 unit decrease in analyst coverage or a 0.2534 unit increase in Sigma, as estimated by model (1), will give rise to a unit increase in bidders' announcement returns.

<sup>82</sup> Another way to test Hypothesis (2)B is to examine whether the coefficient of Information Asymmetry is significantly negative for a subsample conveying negative information (equity financed cash deals and share deals) and positive for a subsample conveying positive information (non-equity financed cash deals). In unreported results, the estimated coefficient of Sigma is positive at a 1% significant level for non-equity financed cash deals, regardless of the model employed. While it is insignificant for equity financed cash deals and significantly negative for share deals, when it is estimated by model (1) and (2). The change in the sign of estimated coefficient of Information Asymmetry (Sigma) indicates a negative (positive) relation between the value effects of information asymmetry conditional on bad (good) news and the degree of information asymmetry. Thus, this lends support to Hypothesis (2)B, that the value effects of information asymmetry are conditional on information content.



signals by investors, have diminishing returns with subsequent bids. Therefore, Testable Prediction (5) is supported.

These results can be explained as a consequence of a declining scale of upward-revaluation through constant information dissemination. More specifically, the information released via takeover announcements leads investors to revalue acquiring firms. In the revaluation process, investors regard other-financed cash deals as a sign of undervaluation which signals positive information. Hence they assign positive value-correction to these acquiring firms. The scale of this revaluation by and large decreases in a merger series due to the declining information asymmetry with subsequent bids. Given that revaluation is a determinant of a bidder's announcement return, the scale of this upward revaluation in a declining trend should result in declining bidders' gains.

For share deals (presented in Table 5.7 panel D), neither the coefficient of Frequent Bidder nor the coefficient of Bid Order is significant, regardless of which model is used to estimate the coefficients. This insignificance is inconsistent with the results reported on non-equity financed cash deals. It implies that there is no clear trend on bidders' gains with subsequent share deals. Thus, the declining abnormal returns, as shown by non-equity financed cash deals, do not hold for serial acquisitions which send out negative information. This result is supportive evidence to Testable Prediction (6).

Table 5.7 panel C reports estimations for equity financed cash deals. Model (3) estimates the coefficient of Frequent Bidder as 0.0387, which is 5% significant. The

significant positive relation indicates that, rather than underperforming, subsequent bids actually outperform the initial bid. Therefore, increasing, rather than decreasing, abnormal returns expected for acquisitions conveying negative information, as suggested by Testable Prediction (6).<sup>83</sup> This is attributable to the downward revaluation effects in relation to serial equity financed cash deals. Investors revalue acquiring firms around takeover announcements. They regard equity financed cash deals as a sign of overvaluation which signals negative information. Hence, they assign negative value-correction to these acquiring firms in the revaluation process. In a merger series, information asymmetry decreases with subsequent bids, and hence the magnitude of revaluation also declines. This revaluation, together with estimated synergies created by the combined units, determines bidders' gains. The constant decrease in the scale of this negative revaluation, therefore, should lead to increasing bidders' gains with subsequent acquisitions.

Overall, the estimation results are considerably diverse across three subsamples. This indicates that the observed declining abnormal returns in an acquisition series, accompanied by decreasing information asymmetry surrounding the acquiring firm, are not generalizable for all observations. The different patterns shown by announcement returns in serial acquisitions arise from variations in revaluation effects. These variations are driven by differing information contents signalled by takeover announcements, in particular the payment financing methods of takeovers. Therefore, it can be concluded that the value-enhancing effects of information asymmetry on

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<sup>83</sup> In univariate tests (subsection 5.4.2), the first order bids generate higher abnormal returns than higher order bids, when equity financed cash deals are announced. However, frequent bidders do significantly outperform casual bidders, as suggested in this cross-sectional regression analysis. The inconsistency between results from univariate tests and cross-sectional regression analyses can be attributed to the influence of other explanatory variables. The acquisitiveness of acquiring firms has significantly positive effects once other factors are accounted for.

takeovers are conditional on information contents. Thus, Hypothesis (2)A is rejected, and Hypothesis (2)B is accepted.

#### 5.4.4 Robustness Test Results

Results from univariate tests and cross-sectional regression analyses show that information asymmetry surrounding a frequent bidder decreases with subsequent bids. Furthermore, there is a decline in bidders' announcement period returns with subsequent mergers. However, once frequent bidders are partitioned by their payment financing methods, the patterns of their short-run gains along their respective acquisition series are characterized differently. Non-equity financed serial cash deals generate declining announcement returns with subsequent bids, while this trend cannot be seen in serial equity financed cash deals or share deals. The robustness of these empirical results is then tested in this subsection by using a different information asymmetry proxy, bid order classification and acquisition series identification.

Previously, stock idiosyncratic volatility (Sigma) was measured over a (t+6, t+205) event window as one of the post-bid information asymmetry proxies. For frequent bidders, the time interval between bids in a merger series may be less than 206 days. Therefore, the use of this (t+6, t+205) window in measuring post-bid Sigma may include the announcement effects of subsequent bids. In order to control these announcement effects, acquisitions with less than a 30-day time interval are excluded from the sample, and a (t+5, t+30) ((t-30, t-5)) window is used in measuring post-bid (pre-bid) Sigma. Table 5.8 reports the results from this robustness test. As shown in column 2 & 3, the positive difference between Post- & Pre-bid MV and VO/NOSH

remain significant, indicating a decline in information asymmetry after a takeover announcement. However, there is no significant different between post- and pre-bid Sigma.<sup>84</sup>

The bid order classification was previously based on a cumulative method, i.e. serial bids were classified into the 1<sup>st</sup> order bids, 2<sup>nd</sup> and higher order bids, 3<sup>rd</sup> and higher order bids, etc. To eliminate the effects of higher-ranked bids in a portfolio, only transactions with exactly the same ranking in their respective merger series are included in one portfolio. This approach partitions the sample into the 1<sup>st</sup> order bids, 2<sup>nd</sup> order bids, 3<sup>rd</sup> order bids, etc. Information asymmetry around the 1<sup>st</sup> order bid is then compared with asymmetric information around the 2<sup>nd</sup> to the 10<sup>th</sup> order bids respectively. The results, based on this bid order classification, are presented in Table 5.9. It shows that there is a constant increase in FINE and MV, and a constant decrease in Sigma with subsequent bids. These findings further support Hypothesis (1) and Testable Prediction (2).

Ideally, the conditional effects of information contents can be evaluated by comparing frequent bidders' gains, for subsamples of takeover series with consistent payment financing methods. However, over a 3-years window, there are only 301 transactions announced by frequent bidders who make cash payments for all transactions during the 3 years. In addition, there are only 4 transactions announced by frequent bidders who constantly make equity payments during the 3 years. Given the limited number of observations, a different methodology is then employed for a

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<sup>84</sup> The insignificance may not necessarily indicate an unchanged information asymmetry surrounding an acquirer, as SIGMA can be affected by factors other than the information asymmetry between managers and investors. For instance, information asymmetry between investors and a divergence of opinion among investors about the value of acquisitions can all attribute to changes in stock return volatility.

robustness test. Specifically, merger series of a firm are identified by the number of bids the firm announced during a rolling 36-month period. These bids are successive bids using the same payment methods. The order of a transaction is then determined by the rank of the bid in the merger series it belongs to. The difference in bidders' gains with subsequent cash/share deals are reported in Table 5.10. The first two columns show that there is no significant difference in announcement returns with subsequent share deals. However, the last two columns present announcement returns generated by first order cash deals as significantly higher than those generated by the 5<sup>th</sup> & higher order and 6<sup>th</sup> & higher order cash deals. The indifferent subsequent announcement returns in share deal series, and the decreasing subsequent announcement returns in cash deal series, are consistent with the results reported in 5.3. They further suggest that the value effects of information asymmetry are conditional on the information content (Hypothesis (2)B).

## 5.5 Conclusions

Developed upon Diamond and Verecchia's (1987) announcement return model, Moeller *et al.* (2006) find that for a given distribution of returns, the expected returns conditional on good news increase as asymmetric information increases, while those conditional on bad news decrease as asymmetric information increases.<sup>85</sup> Exploiting their line of research, this chapter examines the value effects of dynamic information asymmetry inherent in serial acquisitions. This serial acquisition framework provides an ideal context where these changes in information asymmetry can be quantified.

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<sup>85</sup> More specifically, Moeller *et al.* (2006) documents that bidders' announcement returns for acquisitions of public firms paid for with equity decrease as information asymmetry increases. In contrast, abnormal returns for acquisitions of public firms paid for with cash increase as information asymmetry increases.

More specifically, a decreasing rate of information dissemination is inherent in a bidder's serial takeover announcement process, as gradually more information concerning this bidder becomes readily available in the market, and thus less information remains to be released, with subsequent acquisitions. Therefore, it is assumed that the higher the rank of a bid in an acquisition series, the lower the degree of information asymmetry surrounds it.

Empirical evidence based on univariate tests show that information asymmetry surrounding an acquirer decreases after the firm's takeover announcement, and this asymmetry further decreases with subsequent bids in most cases. Moreover, such a decline in information asymmetry is generally accompanied by diminishing bidders' gains in an acquisition series. However, this decrease in bidders' gains, as shown by a t-test on difference of means, is attributed almost exclusively to non-equity financed cash deals. Specifically, most of the statistically significant paired differences, in bidders' gains between the initial and following bids in a merger series, are reported for non-equity financed cash deals.

Furthermore, when bidders' short-run returns over a 5-day event window are regressed on bid order and other factors, the coefficients of Bid Order and Frequent Bidder dummy are significantly negative for non-equity financed cash deals. However, they are insignificant and even significantly positive for equity financed offers and share deals respectively. The negative coefficient suggests that if the information signalled by a takeover announcement were positive (a non-equity financed cash deal is announced), a decline in information asymmetry (presented by increasing bid order in a merger series) significantly pulls down frequent bidders' gains. However, as

indicated by the insignificant or significantly positive coefficients, if the information content is negative, decreasing information asymmetry has either no significant effect or significantly positive effects on frequent bidders' gains.

Accordingly, these empirical results show that information asymmetry and information content together can explain frequent bidders' announcement returns. Takeover announcements release firm information to the market. With the arrival of new information, investors update their valuation of the acquiring firms. This revaluation, together with estimated synergies of the combined unit, determines bidders' announcement returns. The scale of this revaluation is influenced by the information environment of the firm concerned. Less-covered companies, subject to severe information asymmetry, are likely to be given more value corrections with their takeover announcements. On the other hand, the direction of this revaluation largely depends on the information content. Investors regard non-equity financed cash deals (equity financed cash deals or share deals) as positive (negative) signals and assign more (less) value to the acquiring firms.

Therefore, in a merger series, the scale of investor revaluation, in general, constantly decreases because of the declining information asymmetry inherent in this series. Frequent acquirers announcing non-equity financed cash deals (equity financed cash deals or share deals) should expect their upward (non-upward) revaluations to continually decrease, in general, with subsequent takeover announcements. Consequently, given that revaluation is a component of bidders' gains, non-equity financed serial cash deals should generate declining announcement returns. Conversely, this trend cannot be seen in serial equity financed cash deals and share

deals, because their non-upward revaluations constantly decrease with subsequent takeover announcements.

This rationale underlying frequent bidders' short-run performance is in line with the predications of the information asymmetry hypothesis (Moeller *et al.*, 2006). Moreover, it has furthered the theoretical implications of the information asymmetry hypothesis on corporate takeovers by introducing a relation between takeovers and dynamic information asymmetry. The relationship between information asymmetry and corporate takeovers was previously a one-side connection, where the signaling effects of payment methods in the presence of information asymmetry, influenced the value creation of takeover transactions (Eckbo *et al.*, 1990 and Myers and Majluf, 1984). In this chapter, this one-side connection has been extended into a dynamic interaction which allows for a change in the information environment, surrounding acquiring firms, brought about by takeovers. The changes in such an information environment also bear an impact on bidders' gains.

In addition to the contribution made to information asymmetry literature, this research has furthered the understanding of frequent bidders' short-run returns. A decline in bidders' announcement period returns with subsequent mergers has been widely documented in literature (e.g., Schipper and Thompson, 1983; Loderer and Martin, 1990). The empirical findings in this chapter have indicated that such declining returns are not generalizable. Once frequent bidders are partitioned by their payment financing methods, the patterns of their short-run gains along their respective acquisition series can be characterized differently. This inconsistency with existing literature is attributable to the significant signaling implications of payment financing



methods in the presence of information asymmetry. This is one of the primary factors underlying the stock performances of frequent bidders.

Given the relevance of both information asymmetry and information content to the value effects of serial acquisitions, this research has gone beyond the inadequate existing studies on frequent bidders by applying a theory which can sufficiently rationalize the performance of frequent bidders. Furthermore, it has provided a more coherent description of the value effects of serial acquisitions. More specifically, the reported subsequent bidders' gains are inconsistent with the predictions of the capitalization hypothesis (Ismail, 2008), as announcement returns of the 4<sup>th</sup> bids remain positive. Although the documented declining returns in an acquisition series are in line with the theoretical implications of diminishing returns hypothesis or organizational learning hypothesis (Conn *et al.*, 2004), both fail to explain why this declining pattern does not exist in equity financed offers or share deals. It leaves information asymmetry hypothesis (conditional on information contents) as the theory which can begin to rationalize the performance of serial bids.

In addition to the three contributions to literature discussed above, the findings of this study, on the relevance of dynamic information asymmetry to the value effects of serial takeovers, carry significant implications for corporate organizations in the takeover market. Specifically, this research can facilitate acquiring firms to balance their information and investment efficiency. Information asymmetry surrounding a frequent acquiring firm is ever changing, as the firm's takeover announcements constantly disseminate firm information to the market. Given this, as well as the trade-off between information efficiency and investment efficiency (Singh and

Yerramilli, 2009)<sup>86</sup>, purely seeking positive revaluation effects at takeover announcements, generate more destructive investment outcomes to extremely acquisitive bidders than to casual bidders. Instead, acquisitive bidders should focus more on investment projects that generate long-run value.

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<sup>86</sup> Singh and Yerramilli (2009) claim that the balance between transparency and investment efficiency depends on the proportion of a firm's value attributable to its growth opportunities. For firms with a fewer growth opportunities, the losses from shrinking investment opportunities far outweigh the gains from increased transparency. Conversely, for firms with greater growth opportunities, an increase in transparency lowers the sensitivity of stock price to managers' efforts, corrects overinvestment, and thus increases firm value. Developing upon this line of research in the takeover context, acquisitive bidders, who attribute a great proportion of their firm value to growth opportunities, should improve information transparency, lowers unnecessary managerial pay-performance sensitivity, and in turn increase firm value in the long-run.

**Table 5.1. Empirical Evidence on Frequent Bidders and Theoretical Implications**

<b>Panel A: Empirical Evidence</b>				
<b>1. Casual vs. Frequent Bidders</b>	<b>2. Subsequent Bids</b>			
	<b>2.1 Subsequent decline in acquisition series</b>	<b>2.2 Successful first bid in acquisition series</b>	<b>2.3 Frequency in acquisition series</b>	<b>2.4 Similarities in acquisition series</b>
1.a. Acquisitions announced by frequent acquirers have more favourable impacts on the long-run performance (returns & changes in profit margins) than do single acquisitions (Stegemoller, 2001; Rovit and Lemire, 2003);	2.1.a. Frequent bidders' short-run returns remain positive to the 4 <sup>th</sup> bid (Asquith, Bruner and Mullins, 1983; Malatesta and Thompson, 1985; Ismail, 2008);	2.2. Successful (unsuccessful) first bid is followed by a decline (increase) in performance (Ismail, 2008).	2.3.a The greater the time difference, the larger the announcement returns (Fuller <i>et al.</i> 2002);	2.4. For dissimilar (similar) deals, bidders' experience is negatively (positively) related with long-run and short-run performance (Haleblian and Frielstein, 1999; Fuller <i>et al.</i> , 2002).
1.b. Frequent bidders do underperform in the short-run (Ismail, 2008) .	2.1.b. Frequent bidders' short-run returns decline with subsequent mergers (Schipper and Thompson, 1983; Loderer and Martin, 1990).		2.3.b If the difference is too large, the returns start to decline (Hayward, 2002).	

Table 5.1 Continued

Panel B: Theoretical Implications									
Indigestion Hypothesis		Doesn't support 1.a but support 1.b	Support 2.1.b but / doesn't support 2.1.a			Support 2.3.a but / doesn't support 3.b			
Managerial Hubris Hypothesis		Doesn't support 1.a but support 1.b	/	Support 2.2				/	
Diminish Return Hypothesis		/	Support 2.1.b	Support 2.2				/	
Capitalization Hypothesis		/	Doesn't Support 2.1.a but support 2.1.b	/				/	
Organizational Learning Hypothesis		Support 1.a but doesn't support 1.b	Support 2.1.b (due to 2.3.a)	Support 2.2	/			Support 2.4	
Info. Asymmetries Hypothesis	Irrelevant of info. Contents	Support 1.b	Support 2.1.b	/		Support 2. 3.a			/
Conditional on info. Contents		Conditionally support 1.b	Conditionally 2.1.b	Support	/	Conditionally 2.3.a	Support	Conditionally 2.4	Support

**Table 5.2. Comparative Sample Statistics for Merger Series across Different Deal Characteristics**

The descriptive statistics in this table are based on the sample of 10,556 acquisitions. Acquisitions announced during 1985-2007 are included in this sample, if the bidder is, a UK firm listed in LSE, AIM, USM or London Tech, with more than £1 mil market value, has less than 50% holding of the targets before announcements, acquire more than 50% of target shares in the transaction and with sufficient DataStream data. Moreover, the deal value is required to be over £1 mil. Merger series of a firm are identified by the number of bids the firm announced during a 36-month period prior to an announcement date. The order (rank) of a transaction in a merger series is determined by the number of bids in the prior 36-month. The first transaction in a merger series is then classified as a casual bidder or the 1st order bid of a frequent bidder. Deal value is presented in £mil. CAR3D (CAR5D) is the abnormal returns to bidders in a 3-day (5-day) event window. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively, based on t-test of the mean equals to 0 or not.

<i>Bid Order in a Merger Series</i>	<i>Number</i>	<i>Time Interval (in Days)</i>	<i>Deal Value (£Mil)</i>	<i>MV of Bidders (£Mil)</i>	<i>CAR3D (%)</i>	<i>CAR5D (%)</i>
1 <sup>st</sup>	2865	1776.840	4572.180	709.839	2.025***	2.191***
2 <sup>nd</sup> and more	7691	263.904	50437.810	1712.890	0.723***	0.833***
3 <sup>rd</sup> and more	5515	201.750	64830.340	1947.220	0.618***	0.697***
4 <sup>th</sup> and more	3905	162.322	85553.740	2244.090	0.511***	0.586***
5 <sup>th</sup> and more	2780	138.405	28794.450	2460.560	0.448***	0.514***
6 <sup>th</sup> and more	1958	118.472	1725.330	2413.160	0.384***	0.467***
7 <sup>th</sup> and more	1419	105.771	969.864	2338.360	0.362***	0.459***
8 <sup>th</sup> and more	1045	89.763	925.328	1887.360	0.312**	0.380***
9 <sup>th</sup> and more	794	79.722	849.094	1807.040	0.138	0.197
10 <sup>th</sup> and more	628	74.064	680.420	1740.780	0.333*	0.405*

**Table 5.3. Comparative Sample Statistics for All, Casual and Frequent Bidders across Different Deal Characteristics**

The table compares descriptive statistics for all bidders, casual bidders and frequent bidders conditional on target public status, target domicile, industrial diversification and payment financing methods. Public targets are named as listed firms, while private and subsidiary targets are referred to as unlisted firms. Acquisitions between firms that share the same 3-digit SIC code are referred to as related transactions. Equity financed cash deals are cash deals with new equity issues 12 month prior to the takeover announcements, and non-equity financed cash deals are those without new equity issues. Deal value is presented in £mil. CAR3D (CAR5D) is the abnormal returns to bidders in a 3-day (5-day) event window. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively, based on t-test of the mean equals to 0 or not.

	<i>Number</i>	<i>Deal Value</i> (£Mil)	<i>MV of Bidders</i> (£Mil)	<i>CAR3D</i> (%)	<i>CAR5D</i> (%)
<b>Panel A: All Bidders</b>					
<b>Target Public Status:</b>					
<b>Unlisted</b>	8028	27752.400	1233.410	1.215***	1.360***
<b>Listed</b>	701	154437.240	3889.440	-0.597***	-0.700***
<b>Target's Domicile:</b>					
<b>Domestic</b>	5270	52.874	757.838	1.211***	1.325***
<b>Cross-Border</b>	3459	102028.520	2606.110	0.827***	0.975***
<b>Industrial Diversification:</b>					
<b>Related Industry</b>	2209	56970.400	1469.320	1.666***	1.842***
<b>Unrelated Industry</b>	6520	31160.400	1438.830	0.856***	0.962***
<b>Payment &amp; Financing Combinations:</b>					
<b>Share deals</b>	432	17398.053	1286.651	4.197	4.321
<b>Equity financed Cash deals</b>	379	8859.780	1646.010	0.991***	1.222***
<b>Non-equity financed Cash deals</b>	2543	6667.140	1808.110	0.847***	0.971***
<b>Panel B: Casual Bidders</b>					
<b>Target Public Status:</b>					
<b>Unlisted</b>	945	4950.720	661.345	2.224***	2.454***
<b>Listed</b>	101	629.961	1221.470	-0.213	-0.602
<b>Target's Domicile:</b>					
<b>Domestic</b>	696	51.920	383.387	2.263***	2.480***
<b>Cross-Border</b>	350	15903.270	1515.060	1.440***	1.479***
<b>Industrial Diversification:</b>					
<b>Related Industry</b>	285	5825.390	633.684	3.248*	3.454*
<b>Unrelated Industry</b>	761	4027.470	743.005	1.492***	1.640***
<b>Payment &amp; Financing Combinations:</b>					
<b>Share deals</b>	73	311.491	282.878	8.397	8.626
<b>Equity financed Cash deals</b>	24	2152.150	403.976	1.859***	2.176***
<b>Non-equity financed Cash deals</b>	325	895.168	768.518	1.075***	1.251***

**Table 5.3 continued**

<i>Panel C: Frequent Bidders</i>					
<b>Target Public Status:</b>					
<b>Unlisted</b>	7083	36160.300	1438.000	0.848***	0.966***
<b>Listed</b>	600	218566.190	4956.630	-0.750***	-0.740***
<b>Target's Domicile:</b>					
<b>Domestic</b>	4574	53.300	918.988	0.761***	0.825***
<b>Cross-Border</b>	3109	124653.710	2887.850	0.668***	0.844***
<b>Industrial Diversification:</b>					
<b>Related Industry</b>	1924	80032.150	1836.690	0.967***	1.130***
<b>Unrelated Industry</b>	5759	40557.640	1671.830	0.642***	0.734***
<b>Payment &amp; Financing Combinations:</b>					
<b>Share deals</b>	359	30972.372	2057.911	0.959	1.001
<b>Equity financed Cash deals</b>	355	10994.880	2037.870	0.715***	0.919***
<b>Non-equity financed Cash deals</b>	2218	8494.930	2129.000	0.777***	0.884***

**Table 5.4. Pre- and Post-Announcement Information Asymmetries**

This table reports the pre- and post-bid differences in information asymmetry. Information asymmetry is quantified by Sigma, F1NE, VO/NOSH and MV. Post-bid (Pre-bid) Sigma is calculated as the standard deviation of market adjusted residuals of bidders' daily stock returns measured during the period (t+6, t+205) ((t-205, t-6)) where t is the acquisition announcement day. Post-bid (Pre-bid) F1NE is measured by the number of analysts reporting EPS forecasts for the forthcoming fiscal year to I/B/E/S in the month after (before) the announcement day. Post (Pre) VO/NOSH is the average number of shares traded during the month ending after (before) the takeover announcement divided by the number of shares outstanding. Post-bid (Pre-bid) MV is measured as market capitalization of the bidder 10 days after (prior to) the announcement date. T statistics are reported in italics.

		<i>F1NE</i>	<i>MV</i>	<i>VO/NOSH</i>	<i>Sigma</i>
<i>Panel A. All Observations</i>					
<b>Pre-bid</b>	<b>Mean</b>	7.3023	1446.8627	0.0040	0.0218
	<b>t-value</b>	<i>112.13</i>	<i>20.40</i>	<i>33.08</i>	<i>69.19</i>
<b>Post-bid</b>	<b>Mean</b>	7.2747	1466.1859	0.0043	0.0209
	<b>t-value</b>	<i>112.37</i>	<i>20.54</i>	<i>46.97</i>	<i>160.00</i>
<b>Post-bid minus Pre-bid</b>	<b>Mean</b>	0.0290	19.3400	0.0005	-0.0009
	<b>t-value</b>	<i>2.15</i>	<i>3.13</i>	<i>5.52</i>	<i>-3.08</i>
<i>Panel B. Listed Targets</i>					
<b>Pre-bid</b>	<b>Mean</b>	10.2915	3889.4432	0.0045	0.0212
	<b>t-value</b>	<i>37.05</i>	<i>8.45</i>	<i>16.99</i>	<i>34.20</i>
<b>Post-bid</b>	<b>Mean</b>	10.2140	3948.5817	0.0055	0.0203
	<b>t-value</b>	<i>36.50</i>	<i>8.42</i>	<i>17.49</i>	<i>50.85</i>
<b>Post-bid minus Pre-bid</b>	<b>Mean</b>	-0.0595	53.5700	0.0009	-0.0009
	<b>t-value</b>	<i>-0.86</i>	<i>1.58</i>	<i>3.44</i>	<i>-1.85</i>
<i>Panel C. Unlisted Targets</i>					
<b>Pre-bid</b>	<b>Mean</b>	7.0356	1233.4060	0.0039	0.0218
	<b>t-value</b>	<i>107.22</i>	<i>18.86</i>	<i>30.42</i>	<i>64.60</i>
<b>Post-bid</b>	<b>Mean</b>	7.0141	1249.1841	0.0042	0.0209
	<b>t-value</b>	<i>107.66</i>	<i>19.09</i>	<i>43.85</i>	<i>152.16</i>
<b>Post-bid minus Pre-bid</b>	<b>Mean</b>	0.0360	16.3500	0.0005	-0.0009
	<b>t-value</b>	<i>2.78</i>	<i>2.71</i>	<i>4.84</i>	<i>-2.87</i>



**Table 5.5.Changes in Information Asymmetries with Subsequent Bids**

This table reports the differences in information asymmetry between subsequent bids. Information asymmetry is quantified by Sigma, FINE, VO/NOSH and MV. Pre-bid Sigma is calculated as the standard deviation of market adjusted residuals of bidders' daily stock returns measured during the period (t-205, t-6) where t is the acquisition announcement day. Pre-bid FINE is measured by the number of analysts reporting EPS forecasts for the forthcoming fiscal year to I/B/E/S in the month before the announcement day. Pre VO/NOSH is the average number of shares traded during the month ending before the takeover announcement divided by the number of shares outstanding. Pre-bid MV is measured as market capitalization of the bidder 10 days prior to the announcement date. CAR3D (CAR5D) is the abnormal returns to bidders in a 3-day (5-day) window. Merger series of a firm are identified by the number of bids the firm announced during a 36-month period prior to an announcement date. The order (rank) of a transaction in a merger series is determined by the number of bids in the prior 36-month. The first transaction in a merger series is then classified as a casual bidder or the 1st order bid of a frequent bidder. No. of observations are provided in parenthesis. T-values of pair-wised differences in mean are presented in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

		Pre-Bid IA				Bidders' gains	
		FINE	MV	VO/NOSH	Sigma	CAR3D (%)	CAR5D (%)
Panel A. Mean Value of information asymmetries and bidder's gain (mean & No. of observations)							
1st Bid	Mean	5.5760	709.8392	0.0036	0.0271	2.0254***	2.1909***
	N	(1762)	(2749)	(977)	(2749)	(2760)	(2760)
2nd Bid & more	Mean	7.7622	1712.8900	0.0041	0.0198	0.7235***	0.8328***
	N	(6614)	(7616)	(3440)	(7610)	(7612)	(7612)
3rd Bid & more	Mean	8.1455	1947.2200	0.0044	0.0188	0.6185***	0.6969***
	N	(4936)	(5470)	(2580)	(5465)	(5467)	(5467)
4th Bid & more	Mean	8.4987	2244.0900	0.0045	0.0184	0.5107***	0.5864***
	N	(3567)	(3872)	(1927)	(3868)	(3870)	(3870)
5th Bid & more	Mean	8.8749	2460.5600	0.0046	0.0182	0.4484***	0.5140***
	N	(2573)	(2755)	(1387)	(2753)	(2755)	(2755)
6th Bid & more	Mean	9.2273	2413.1600	0.0046	0.0181	0.3837***	0.4671***
	N	(1826)	(1942)	(1017)	(1941)	(1942)	(1942)
7th Bid & more	Mean	9.5177	2338.3600	0.0047	0.0180	0.3617***	0.4590***
	N	(1329)	(1411)	(766)	(1411)	(1411)	(1411)
8th Bid & more	Mean	9.6218	1887.3600	0.0049	0.0180	0.3120**	0.3803***
	N	(981)	(1040)	(574)	(1040)	(1040)	(1040)
9th Bid & more	Mean	9.5386	1807.0400	0.0048	0.0180	0.1385	0.1966
	N	(752)	(790)	(438)	(790)	(790)	(790)
10th Bid & more	Mean	9.5850	1740.7800	0.0046	0.0181	0.3326*	0.4051*
	N	(600)	(625)	(368)	(625)	(625)	(625)

**Table 5.5 Continued**

<i>Panel B. Difference in mean (mean &amp; t-value)</i>							
<b>1-2</b>	<b>Mean</b>	-2.1861***	-1003.0508***	-0.0005	0.0073***	1.3019***	1.3581**
	<b>t-Value</b>	-14.29	-7.89	-1.12	7.49	2.22	2.22
<b>1-3</b>	<b>Mean</b>	-2.5694***	-1237.3808***	-0.0007*	0.0084***	1.4069**	1.4941***
	<b>t-Value</b>	-16.22	-8.39	-1.76	8.80	2.40	2.44
<b>1-4</b>	<b>Mean</b>	-2.9227***	-1534.2508***	-0.0009**	0.0087***	1.5147***	1.6045***
	<b>t-Value</b>	-17.58	-8.62	-2.01	9.14	2.58	2.62
<b>1-5</b>	<b>Mean</b>	-3.2988***	-1750.7208***	-0.0010**	0.0089***	1.5770***	1.6770***
	<b>t-Value</b>	-18.62	-8.53	-2.18	9.34	2.68	2.73
<b>1-6</b>	<b>Mean</b>	-3.6512***	-1703.3208***	-0.0010**	0.0091***	1.6416***	1.7239***
	<b>t-Value</b>	-19.24	-7.74	-2.23	9.46	2.78	2.79
<b>1-7</b>	<b>Mean</b>	-3.9416***	-1628.5208***	-0.0011**	0.0091***	1.6636***	1.7319***
	<b>t-Value</b>	-19.27	-7.06	-2.35	9.41	2.80	2.79
<b>1-8</b>	<b>Mean</b>	-4.0458***	-1177.5208***	-0.0013***	0.0091***	1.7134***	1.8107***
	<b>t-Value</b>	-18.16	-6.97	-2.46	9.34	2.87	2.89
<b>1-9</b>	<b>Mean</b>	-3.9625***	-1097.2008***	-0.0012**	0.0091***	1.8869***	1.9943***
	<b>t-Value</b>	-16.35	-6.42	-2.16	9.23	3.13	3.15
<b>1-10</b>	<b>Mean</b>	-4.0090***	-1030.9408***	-0.0010*	0.0090***	1.6928***	1.7858***
	<b>t-Value</b>	-15.23	-6.26	-1.80	9.06	2.78	2.78

**Table 5.6. Information Asymmetries, Payment Financing and Bid Order**

This table reports the differences in bidders' gains between subsequent bids, conditional on payment financing. Merger series of a firm are identified by the number of bids the firm announced during a 36-month period prior to an announcement date. The order of a bid is determined by the rank of the bid in a merger series. The first transaction in a merger series is then classified as a casual bidder or the 1st order bid of a frequent bidder. Equity financed (Non-equity financed) cash deals are cash acquisitions with (without) equity issues 1-year prior to the announcement days. T-values of pair-wised differences in mean are presented in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

Bid Order	<i>Share deals</i>		<i>Equity financed Cash deals</i>		<i>Non-equity financed Cash deals</i>	
	<i>CAR3D</i> (%)	<i>CAR5D</i> (%)	<i>CAR3D</i> (%)	<i>CAR5D</i> (%)	<i>CAR3D</i> (%)	<i>CAR5D</i> (%)
<i>Panel A. Mean Value of bidder's gain</i>						
<b>1st Bid</b>	8.3973 <i>1.46</i>	8.6265 <i>1.45</i>	1.8591*** <i>2.76</i>	2.1755*** <i>2.94</i>	1.0749*** <i>5.28</i>	1.2513*** <i>5.28</i>
<b>2nd Bid &amp; more</b>	0.9586* <i>1.72</i>	1.0011* <i>1.77</i>	0.7148*** <i>3.12</i>	0.9186*** <i>3.54</i>	0.7767*** <i>8.29</i>	0.8842*** <i>8.26</i>
<b>3rd Bid &amp; more</b>	-0.0848 <i>-0.16</i>	-0.2362 <i>-0.43</i>	0.5159* <i>1.87</i>	0.6765** <i>2.18</i>	0.6864*** <i>6.54</i>	0.7736*** <i>6.25</i>
<b>4th Bid &amp; more</b>	0.2815 <i>0.37</i>	0.0238 <i>0.03</i>	0.2476 <i>0.88</i>	0.4051 <i>1.18</i>	0.5912*** <i>5.21</i>	0.7090*** <i>5.22</i>
<b>5th Bid &amp; more</b>	0.5931 <i>0.63</i>	0.1836 <i>0.19</i>	0.2034 <i>0.69</i>	0.3063 <i>0.93</i>	0.4886*** <i>3.62</i>	0.6163*** <i>3.80</i>
<b>6th Bid &amp; more</b>	1.3034 <i>1.21</i>	1.0410 <i>1.01</i>	0.3123 <i>0.93</i>	0.4503 <i>1.17</i>	0.4903*** <i>3.29</i>	0.6333*** <i>3.44</i>
<b>7th Bid &amp; more</b>	1.2958 <i>1.00</i>	0.7926 <i>0.64</i>	0.3179 <i>0.88</i>	0.5554 <i>1.30</i>	0.7067*** <i>3.87</i>	0.8396*** <i>3.67</i>
<b>8th Bid &amp; more</b>	0.0143 <i>0.01</i>	-0.6769 <i>-0.51</i>	0.4063 <i>0.93</i>	0.4552 <i>0.89</i>	0.6044*** <i>2.69</i>	0.5250* <i>1.90</i>
<b>9th Bid &amp; more</b>	-0.6125 <i>-0.40</i>	-1.5478 <i>-1.04</i>	0.3862 <i>0.67</i>	0.3687 <i>0.54</i>	0.3609 <i>1.41</i>	0.2054 <i>0.63</i>
<b>10th Bid &amp; more</b>	-0.5845 <i>-0.31</i>	-1.6122 <i>-0.90</i>	0.7396 <i>1.06</i>	0.7779 <i>0.95</i>	0.6425** <i>2.14</i>	0.5950 <i>1.57</i>

**Table 5.6 continued**

<i>Panel B. Difference in mean</i>						
<b>1-2</b>	7.4387	7.6254	1.1443	1.2569	0.2982	0.3671
	<i>1.29</i>	<i>1.27</i>	<i>1.61</i>	<i>1.61</i>	<i>1.33</i>	<i>1.41</i>
<b>1-3</b>	8.4821	8.8627	1.3432*	1.4990*	0.3885*	0.4777*
	<i>1.47</i>	<i>1.48</i>	<i>1.84</i>	<i>1.87</i>	<i>1.70</i>	<i>1.79</i>
<b>1-4</b>	8.1158	8.6027	1.6115**	1.7704**	0.4837**	0.5423**
	<i>1.40</i>	<i>1.43</i>	<i>2.20</i>	<i>2.17</i>	<i>2.07</i>	<i>1.99</i>
<b>1-5</b>	7.8042	8.4429	1.6557**	1.8692**	0.5863**	0.6350**
	<i>1.34</i>	<i>1.40</i>	<i>2.25</i>	<i>2.31</i>	<i>2.40</i>	<i>2.21</i>
<b>1-6</b>	7.0939	7.5855	1.5468**	1.7252**	0.5846**	0.6180**
	<i>1.21</i>	<i>1.25</i>	<i>2.05</i>	<i>2.07</i>	<i>2.32</i>	<i>2.06</i>
<b>1-7</b>	7.1015	7.8339	1.5412**	1.6201**	0.3682	0.4117
	<i>1.20</i>	<i>1.28</i>	<i>2.01</i>	<i>1.90</i>	<i>1.35</i>	<i>1.25</i>
<b>1-8</b>	8.3830	9.3034	1.4528*	1.7203*	0.4705	0.7263**
	<i>1.42</i>	<i>1.52</i>	<i>1.81</i>	<i>1.91</i>	<i>1.55</i>	<i>2.00</i>
<b>1-9</b>	9.0098	10.1743*	1.4729*	1.8068*	0.7140**	1.0469***
	<i>1.51</i>	<i>1.65</i>	<i>1.66</i>	<i>1.79</i>	<i>2.18</i>	<i>2.59</i>
<b>1-10</b>	8.9818	10.2387*	1.1195	1.3976	0.4324	0.6563***
	<i>1.48</i>	<i>1.64</i>	<i>1.15</i>	<i>1.27</i>	<i>1.19</i>	<i>1.47</i>

**Table 5.7. Subsequent Decline in Bidders' Announcement Return**

This table provides the estimated coefficients of two explanatory variables, based on the cross-sectional regression equations:

$$R_m - R_i = \alpha + \beta 1 \text{Frequent Bidder} + \beta 2 \text{Bid Order} + \beta 3 \text{Time Interval} + \beta 4 X + \beta 5 Z + \beta 6 \text{Control Variable} \quad (5.1)$$

Where the regressand is the 5-day window abnormal returns to bidders. Frequent Bidder is a dummy variable, which takes the value of 1 (0), if the acquirer is a frequent (casual) bidder. Bid Order is the order of a deal in an acquisition series. Time Interval is the time difference between bids measured by days. The vector of explanatory variables X consist of proxies of bidders' information asymmetry which are measured by market capitalization (MV), number of analysts following (FINE), trading volume (VO/NOSH) and return volatility (Sigma); another vector of explanatory variables Z present the information content signalled by a takeover announcement, including Non-equity financed Cash deals (non-equity financed cash deals=1) and Share deals (share deals=1). Control Variable are factors which are suggested to be related with acquirer's performance, including Relative Size (deal value divided by the bidder's market value), Target Status (listed targets=1), Target's Domicile (cross border transactions=1), Industrial Diversification (cross industry transactions=1). T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

Model (1) is:  $R_m - R_i = \text{Frequent Bidder} + \text{Bid Order} + \text{Time Interval} + \text{Relative Size} + \text{Target's Domicile} + \text{Industrial Diversification} + \text{Target Status} + \text{Non-equity financed Cash deals} + \text{Share deals} + \text{FINE} + \text{Sigma}$

Model (2) is:  $R_m - R_i = \text{Frequent Bidder} + \text{Bid Order} + \text{Time Interval} + \text{Relative Size} + \text{Target's Domicile} + \text{Industrial Diversification} + \text{Target Status} + \text{Non-equity financed Cash deals} + \text{Share deals} + \text{MV} + \text{Sigma}$

Model (3) is:  $R_m - R_i = \text{Frequent Bidder} + \text{Bid Order} + \text{Time Interval} + \text{Relative Size} + \text{Target's Domicile} + \text{Industrial Diversification} + \text{Target Status} + \text{Non-equity financed Cash deals} + \text{Share deals} + \text{VO/NOSH} + \text{Sigma}$

Model (4) is:  $R_m - R_i = \text{Frequent Bidder} + \text{Bid Order} + \text{Time Interval} + \text{Relative Size} + \text{Target's Domicile} + \text{Industrial Diversification} + \text{Target Status} + \text{Non-equity financed Cash deals} + \text{Share deals} + \text{FINE} + \text{MV} + \text{VO/NOSH} + \text{Sigma}$

<i>Variables</i>	<i>Bidder's CARs</i> <i>Model (1)</i>	<i>Bidder's CARs</i> <i>Model (2)</i>	<i>Bidder's CARs</i> <i>Model (3)</i>	<i>Bidder's CARs</i> <i>Model (4)</i>
<b>Panel A: Estimation for entire sample</b>				
<b>Frequent Bidder</b>	-0.0089 *** -2.72	-0.0111 *** -3.24	-0.0132 *** -3.31	-0.0083 ** -2.22
<b>Bid Order</b>	-0.0003 -1.45	-0.0006 *** -2.86	-0.0007 *** -3.16	-0.0003 -1.50
<b>Adj. R-Squared (%)</b>	1.35	1.32	1.17	1.16
<b>F</b>	10.24	11.49	8.33	6.33
<b>N</b>	7407	8637	6798	5905

**Table 5.7 continued**

<i>Panel B: Estimation for non-equity financed cash deals</i>						
<b>Frequent Bidder</b>	-0.0057	-0.014	***	-0.0132	**	-0.0036
	-1.11	-2.73		-2.27		-0.62
<b>Bid Order</b>	-0.0004	-0.0006	**	-0.0005		-0.0003
	-1.46	-2.07		-1.59		-0.98
<b>Adj. R-Squared (%)</b>	1.18	1.64		1.35		0.88
<b>F</b>	4.08	5.68		4.1		2.53
<b>N</b>	2318	2525		2041		1898
<i>Panel C: Estimation for equity financed cash deals</i>						
<b>Frequent Bidder</b>	0.0258	0.024		0.0387	**	0.0402 *
	1.32	1.42		2.04		1.85
<b>Bid Order</b>	-0.0004	-0.0005		-0.0004		-8.44E-06
	-0.54	-0.80		-0.52		-0.01
<b>Adj. R-Squared (%)</b>	1.82	0.87		1.32		2.46
<b>F</b>	1.61	1.37		1.48		1.6
<b>N</b>	296	379		326		263
<i>Panel D: Estimation for share deals</i>						
<b>Frequent Bidder</b>	0.0057	0.0071		-0.0052		0.0173
	0.23	0.29		-0.18		0.57
<b>Bid Order</b>	0.0006	-0.0032		-0.0034		0.0006
	0.34	-1.44		-1.39		0.33
<b>Adj. R-Squared (%)</b>	13.88	8.81		8.46		14.33
<b>F</b>	6.07	5.55		4.25		4.16
<b>N</b>	284	425		318		209

**Table 5.8. Robustness Test: Pre- and Post-Announcement Information Asymmetries**

This table reports the pre- and post-bid differences in information asymmetry. Information asymmetry is quantified by Sigma, FINE, VO/NOSH and MV. Post-bid (Pre-bid) Sigma is calculated as the standard deviation of market adjusted residuals of bidders' daily stock returns measured during the period (t+6, t+30) (t-30, t-6) where t is the acquisition announcement day. Post-bid (Pre-bid) FINE is measured by the number of analysts reporting EPS forecasts for the forthcoming fiscal year to I/B/E/S in the month after (before) the announcement day. Post (Pre) VO/NOSH is the average number of shares traded during the month ending after (before) the takeover announcement divided by the number of shares outstanding. Post-bid (Pre-bid) MV is measured as market capitalization of the bidder 10 days after (prior to) the announcement date. No. of observations are provided in parenthesis. T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

		<i>FINE</i>	<i>MV</i>	<i>VO/NOSH</i>	<i>Sigma</i>
<b>Pre-bid</b>	<b>Mean</b>	7.6123***	1741.3400***	0.0040***	0.0177***
	<b>t-Value</b>	<i>101.29</i>	<i>18.54</i>	<i>38.96</i>	<i>113.08</i>
	<b>N</b>	(6463)	(7509)	(3386)	(7504)
<b>Post-bid</b>	<b>Mean</b>	7.5868***	1764.7500***	0.0044***	0.0179***
	<b>t-Value</b>	<i>101.26</i>	<i>18.66</i>	<i>40.35</i>	<i>117.43</i>
	<b>N</b>	(6471)	(7512)	(3307)	(7510)
<b>Post-bid minus</b>	<b>Mean</b>	-0.0255	22.4100	0.0005	0.0003
<b>Pre-bid</b>	<b>t-Value</b>	<i>-0.28</i>	<i>2.71</i>	<i>5.00</i>	<i>1.45</i>

**Table 5.9. Robustness Test: Changes in Information Asymmetries with Subsequent Bids**

This table reports the differences in information asymmetry between subsequent bids. Information asymmetry is quantified by Sigma, FINE, VO/NOSH and MV. Pre-bid Sigma is calculated as the standard deviation of market adjusted residuals of bidders' daily stock returns measured during the period (t-30, t-6) where t is the acquisition announcement day. Pre-bid FINE is measured by the number of analysts reporting EPS forecasts for the forthcoming fiscal year to I/B/E/S in the month before the announcement day. Pre VO/NOSH is the average number of shares traded during the month ending before the takeover announcement divided by the number of shares outstanding. Pre-bid MV is measured as market capitalization of the bidder 10 days prior to the announcement date. Merger series of a firm are identified by the number of bids the firm announced during a 36-month period prior to an announcement date. The order (rank) of a transaction in a merger series is determined by the number of bids in the prior 36-month. The first transaction in a merger series is then classified as a casual bidder or the 1st order bid of a frequent bidder. No. of observations are provided in parenthesis. T values of pair-wised difference in mean are reported in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

Bid Order	<i>Pre-Bid IA</i>				<i>Bidders' gains</i>	
	<i>FINE</i>	<i>MV</i>	<i>VO/NOSH</i>	<i>Sigma</i>	<i>CAR3D (%)</i>	<i>CAR5D (%)</i>
<i>Panel A. Mean Value of information asymmetries and bidder's gain (mean &amp; No. of observations)</i>						
<b>1st Bid</b>	6.3009 (1632)	826.6502 (2183)	0.0033 (808)	0.0188 (2182)	1.4901*** (2183)	1.7154*** (2183)
<b>2nd Bid</b>	7.2530 (1478)	1412.4940 (1728)	0.0035 (744)	0.0173 (1727)	0.5406*** (1727)	0.7297*** (1727)
<b>3rd Bid</b>	7.5381 (1154)	1421.7835 (1282)	0.0043 (589)	0.0169 (1281)	1.0361*** (1281)	0.9735*** (1281)
<b>4th Bid</b>	7.8399 (762)	2526.2873 (824)	0.0044 (412)	0.0166 (823)	0.4347*** (824)	0.5085*** (824)
<b>5th Bid</b>	8.7720 (579)	2968.7502 (604)	0.0042 (322)	0.0165 (603)	0.6245*** (603)	0.6064*** (603)
<b>6th Bid</b>	9.3806 (310)	3992.9150 (327)	0.0044 (180)	0.0184 (327)	0.7176*** (327)	0.8344*** (327)
<b>7th Bid</b>	9.9907 (214)	3806.0946 (223)	0.0065 (125)	0.0174 (223)	0.0153 (223)	0.3928 (223)
<b>8th Bid</b>	10.7583 (120)	3041.8402 (123)	0.0052 (77)	0.0182 (123)	0.6458** (123)	0.8625*** (123)
<b>9th Bid</b>	10.6941 (85)	3066.3045 (86)	0.0046 (52)	0.0162 (86)	0.0559 (86)	0.0093 (86)
<b>10th Bid</b>	9.2791 (129)	2640.1432 (129)	0.0035 (77)	0.0210 (129)	1.3255*** (129)	1.2278** (129)



**Table 5.9 continued**

<i>Panel B. Difference in mean (mean &amp; t-value)</i>						
<b>1-2</b>	-0.9522*** -4.41	-585.8438*** -3.22	-0.0002 -1.00	0.0014*** 3.00	0.9495*** 4.47	0.9857*** 4.23
<b>1-3</b>	-1.2373*** -5.51	-595.1333*** -2.92	-0.0010*** -3.24	0.0018*** 3.57	0.4540** 2.01	0.7419*** 3.01
<b>1-4</b>	-1.5390*** -6.03	-1699.6371*** -3.79	-0.0011** -2.33	0.0021*** 4.21	1.0554*** 4.54	1.2069*** 4.56
<b>1-5</b>	-2.4712*** -8.67	-2142.1000*** -4.70	-0.0009*** -3.26	0.0022*** 3.97	0.8656*** 3.40	1.1090*** 3.99
<b>1-6</b>	-3.0798*** -8.44	-3166.2648*** -4.10	-0.0011** -2.12	0.0004 0.51	0.7724*** 2.74	0.8810*** 2.83
<b>1-7</b>	-3.6898*** -8.74	-2979.4444*** -3.20	-0.0032*** -3.67	0.0014* 1.86	1.4748*** 4.13	1.3226*** 3.33
<b>1-8</b>	-4.4575*** -8.10	-2215.1900*** -3.15	-0.0019*** -2.83	0.0005 0.53	0.8433** 2.51	0.8529** 2.17
<b>1-9</b>	-4.3933*** -6.81	-2239.6543*** -2.80	-0.0013*** -2.06	0.0025** 2.41	1.4341*** 3.21	1.7061*** 3.07
<b>1-10</b>	-2.9782*** -5.59	-1831.4930*** -3.92	-0.0003 -0.70	-0.0022** -2.09	0.1646 0.34	0.4876 0.86

**Table 5.10. Robustness Test: Information Asymmetries, Payment Methods and Bid Order**

This table reports the differences in bidders' gains between subsequent bids conditional on payment methods. Merger series of a firm are identified by the number of bids the firm announced during a 36-month period prior to an announcement date, which are successive bids with same payment methods. The order (rank) of a transaction in a merger series is determined by the number of bids in the prior 36-month. The first transaction in a merger series is then classified as a casual bidder or the 1st order bid of a frequent bidder. T statistics are provided in italics. Superscripts \*, \*\*, and \*\*\* indicate a significant level of 10%, 5% and 1% respectively.

<i>Bid Order</i>	<i>All Observations</i>			
	<i>Share deals</i>		<i>Cash deals</i>	
	<i>CAR3D</i>	<i>CAR5D</i>	<i>CAR3D</i>	<i>CAR5D</i>
<b>1-2</b>	0.2731	0.2898	-0.0020	-0.0009
	<i>1.05</i>	<i>1.07</i>	<i>-1.18</i>	<i>-0.39</i>
<b>1-3</b>	0.2731	0.2898	-0.0020	-0.0010
	<i>1.05</i>	<i>1.07</i>	<i>-1.19</i>	<i>-0.40</i>
<b>1-4</b>	0.2887	0.3066	-0.0009	0.0009
	<i>1.11</i>	<i>1.13</i>	<i>-0.39</i>	<i>0.36</i>
<b>1-5</b>	0.2683	0.2890	-0.0010	0.0060
	<i>1.03</i>	<i>1.07</i>	<i>-0.55</i>	<i>0.19</i>
<b>1-6</b>	0.2468	0.2662	0.0042	0.0070**
	<i>0.94</i>	<i>0.98</i>	<i>1.40</i>	<i>2.16</i>
<b>1-7</b>	/	/	0.0028	0.0059*
	/	/	<i>0.91</i>	<i>1.66</i>
<b>1-8</b>	/	/	-0.0002	0.0015
	/	/	<i>-0.05</i>	<i>0.36</i>

## **Chapter 6:**

## **Conclusion**

## 6.1 Concluding Remarks

This thesis has examined the value effects of the information environment and of changes in this environment on corporate takeovers. Further, it has suggested the mechanisms under which these value effects work. This research objective was motivated by the existing inadequate research efforts towards understanding the determinants of takeover wealth creation, as well as the importance of information environment, in the market for corporate control from both a theoretical and a practical perspective.

Regarding the theoretical perspective, unevenly distributed firm information, and investors' different interpretations of such information, underlies fundamental theories and hypotheses (for example, neoclassical theory, managerialism theory and misvaluation theory)<sup>87</sup> which have been suggested to rationalize the performance of firms engaged in mergers and acquisitions. When considering from the practical perspective, the nature of information distribution in corporate practice leads to unavoidable information asymmetry surrounding bidding and target firms.<sup>88</sup> Continuous efforts have been made to alleviate this asymmetry through regulatory bodies, such as the Takeover Panel, attempting to enforce prompt and accurate information dissemination. Given the highlighted importance of the information environment from these two perspectives, this thesis has contributed to mergers and acquisitions literature by introducing significant information factors that impact upon

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<sup>87</sup> For neoclassical theory, see for example Gort (1969), Mitchell and Mulherin (1996); for managerialism theory, see for example Seyhun, (1990), Berkovitch and Narayanan (1993); for misvaluation theory, see for example Shleifer and Vishny (2003), Rhodes-Kropf and Viswanathan (2004).

<sup>88</sup> The cost incurred for an outside investor to obtain a firm's information, together with managers' organizational knowledge in interpreting the information from an insider's perspective, which is unattainable for outside investors, leads to firm information remaining unevenly distributed between corporate organizations and outside investors.

the wealth creation of takeovers which have not, or at least inadequately, been examined in previous research.

This thesis addresses four issues inherent in the information dissemination process of takeover announcements. They are, the information asymmetry surrounding information sender (acquiring firms), the information contents (information signalled by takeover announcements), the sentiment shown by information recipients (investors) in interpreting information and market condition (misvaluation). As hypothesized, these factors, designed to describe the information environment surrounding firms engaged in the takeover market, are able to explain the value creation of takeovers to these firms. More specifically, a firm's takeover announcement disseminates firm information to the market and thus gives rise to changes in the information environment surrounding that firm. With the arrival of new information, investors update their assessment of the firm's value. This revaluation process depends on both the content of the information sent out by takeover announcements and investors' reasoning and sentiment involved in interpreting the information.

The value effects of suggested information related factors, as well as the mechanisms under which these value effects work, have brought new factors to the limited focus of existing research that examines the relationship between corporate takeovers and the information environment. Further, the relationship has been extended so to be considered in a dynamic context.

Chapter 1 has addressed the gap that exists in the under-researched and

mis-interpreted misvaluation effects on cash deals.<sup>89</sup> It has explicitly examined the relevance of market conditions (misvaluation) and information content (information signalled by a transaction's payment financing method) to merger activities and their value effects. The results have indicated that bidders' announcement returns are determined by estimated synergies of the resultant unit and revaluation effects of takeover announcements; both of which are influenced by the information environment, in particular market conditions and information content. Three main points can be derived.

Firstly, consistent with Rhodes-Kropf and Viswanathan (2004), the results of this chapter have suggested that investors' reasoning in synergy estimating is hindered by market conditions. In particular, their synergy-estimation errors can be intensified by market conditions. Based on available information, investors estimate the synergies of the resultant unit. Evaluating a bidding firm forms an indispensable part of this synergy-estimation. However, in the presence of misvaluation surrounding an acquiring firm, seldom could each component of misvaluation be correctly valued due to investors' limited access to information. More specifically, since macro level information is more transparent and accessible, they naturally allocate more weight to the market or industry component of misvaluation during high valuation periods; thus underestimating the firm-specific overvaluation. Further, this mis-evaluation gives rise to a hyped synergy-estimation, which consequently leads to a more positive market

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<sup>89</sup> Extant research on the relation between misvaluation and the takeover market has mainly a stock merger focus. Additionally, under the assumption that no equity issue is involved in cash deals, cash mergers are naturally associated with undervaluation, while equity deals correspond to overvaluation. For example, the Shleifer and Vishny (2003) model predicts that "overvaluation could be the motive for most stock acquisition, which increase the buyer's willingness-to-pay in stock mergers, though it has no effect in cash acquisition" (Friedman, 2004, p.1). Nevertheless, this assumption and the conclusion based on it are debatable, since the use of cash as a payment mechanism does not necessarily mean that the actual source of the cash payment comes purely from a firm's internal cash flow. Instead, external equity flow and debt flow serve as two financing alternatives (Schlingemann, 2004). Therefore, after distinguishing the fundamental difference between payment methods and transaction financing, the documented relevance of misvaluation to cash deals is shown to be flawed and needs re-examinations.

reaction to the takeover announcement. Therefore, takeovers tend to occur in clusters during high market- or industry- valuation periods. In addition, takeovers announced during these periods generate higher returns to bidders than those announced during low valuation periods.

Secondly, corporate takeovers release information to the market and, consequently, attract investors and analysts to reappraise a bidder's value. If information asymmetry impedes a firm from revealing its potential to the investment community, this firm is likely to be undervalued by the market. Announcing takeovers disseminates information to the market and gives rise to revaluation. This revaluation process, similar to the findings of Draper and Paudyal (2008), generally raises the stock price around the announcement period. However, the price run-up after reappraisal is conditional on information contents sent out in takeover announcements. If a firm has true potential, releasing good news, for example announcing cash deals especially non-equity financed cash deals, can bid up its share price via revaluation. On the other hand, bad news released, for instance announcing share deals or equity financed cash deals, have a limited effect in driving up the bidder's share price through this revaluation.

These findings are inconsistent with existing literature which state that, cash deals are irrelevant to the overvaluation effects (Shleifer and Vishny, 2003). This inconsistency is attributed to: i) the fundamental difference between cash payment and cash financing, which is assumed not to exist in the majority of previous research and ii) the different effects of each misvaluation component (firm-, industry- and market-components) in the takeover market. Accordingly, this study clarifies the fundamental difference between 'methods of payment' and 'transaction financing

sources'. It further suggests that, given the different financing sources of cash payment, the documented incentives and value effects of misvaluation on cash deals,<sup>90</sup> which are based on the flawed assumption of no equity-involvement in cash payment, are unlikely to be generalizable. In addition, by recognizing different components of misvaluation, this study provides a wider-ranging understanding of misvaluation effects. This understanding furthers the existing knowledge on the relevance of misvaluation to corporate takeovers. This misvaluation was previously examined in isolation by most existing literature, at either a market level or firm level, rather than being considered as a three-tiered system (for market valuation, see Tebourbi (2005) and Bouwman (2006) for example; for firm misvaluation, see Dong et al. (2006) and Ang and Cheng (2006) for example).

Having examined the value effects of misvaluation on corporate takeovers, factors, which may cause this misvaluation, are expected to have some bearing on acquisition gains. Among the factors associated with misvaluation, investor sentiment has attracted great research interests. It has been regarded as an irrational exuberance that drives asset price away from its intrinsic value. The potential value effects of investor sentiment in the takeover market, therefore, have been examined in chapter 4. This research objective also fits into the overarching research area of this thesis (i.e., information environment). Given the potential effects the recipients of this information may have on the manner and outcomes of information processing, any market reaction to the arrival of new information, via takeover announcements, should not only incorporate the message itself (as examined in Chapter 3), but also include the effects of investors' behaviour acting upon the information released. Chapter 4 has examined the relevance of investors' sentiment to targets' gains and takeover premium.

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<sup>90</sup> Previous research (e.g., Shleifer and Vishny, 2003) associates undervaluation with cash deals.



It is one of the first attempts towards quantifying investor sentiment and examining its impacts on corporate takeovers. Moreover, it allows for individual differences in the relation between sentiment and corporate takeovers.<sup>91</sup> Accordingly, investor sentiment has been addressed at both an aggregate market and individual firm level in this chapter. The results are outlined below:

Firstly, pre-takeover information asymmetry about a firm's value gives rise to revaluation during the firm's takeover announcement period. This is because information disseminated via a takeover announcement begins to clarify the existing information asymmetry and thus leads to a revaluation upon this newly released information. The accuracy of re-assessing the firm's asset value is obstructed by the investor sentiment involved. Due to investors' sentiment-laden reactions, their predictions for an acquired firm's stock performance are not necessarily correct. If a transaction is announced during a high sentiment period, then the high investor sentiment in interpreting information sent out by the takeover announcement, in general, drives up the target firm's announcement returns. This finding concerning the sensitivity of stock price to takeover announcements, in the presence of aggregate investor sentiments, is consistent with those of Mian and Sankaraguruswamy (2007). They document that during high sentiment periods, investors are more likely to bid up a firm's share price around a corporate announcement period.

Meanwhile, this upward pricing of acquired firms' shares, in the presence of high investor sentiment, tends to pressurise bidders' managers to pay an inflated takeover

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<sup>91</sup> Previous research on this issue confined investor sentiment to an aggregate market level (e.g., Zhu et al., 2008). This market level research implies that sentiment-laden investors' reactions to one stock (or company) can equally be applied to another stock (or company). However, counter-views, like those of Qiu and Welch (2006) and Baker and Wurgler (2006 & 2007), suggest that sentiment may have cross-sectional differences. Mergers and acquisitions, as individual corporate activities, are more likely to be exposed to these firm specific, rather than market-aggregate, sentiment factors.

premium. This further forces an increase in the premium required by these target firms. Consequently, investor sentiment, in general, drives takeover premium in the same direction as this sentiment. This effect of the prevailing aggregate sentiment on takeover premium is inconsistent with the empirical results of Zhu *et al.* (2008) concerning the US market. They report that it is begin-of-period sentiment rather than prevailing sentiment that is positively related to the premium paid. This inconsistency can be attributed to the different measurements of premium. In their study the difference in market to book value between bidders and targets is employed to measure takeover premium, while the widely accepted percentage difference between offer price and target's share price is used in this research to calculate premium.

Secondly, where cross-sectional variation in the effects of sentiment is concerned, speculative targets, compared with non-speculative targets, are not more vulnerable to the aforementioned effects of sentiment on targets' announcement returns and takeover premium. A lack of such sensitivity is contrary to the empirical findings of Baker and Wurgler (2006 & 2007) on the US stock market. This could be explained by large institutional holdings in the UK market; the strong arbitrage forces of which make the mispricing, driven by investor speculative demands, nonpersistent. Thus, the value effects of sentiment become obscured for speculative targets. Added to this is the different research context. More specifically, takeover announcement returns are primarily driven by takeover bids themselves, rather than a general market condition. Taking over speculative targets is a risky project, regardless of the prevailing sentiment. An investor does not evaluate speculative targets more during a high sentiment period. Moreover, bidders, given an available pool of potential takeover targets, would not pay more for those associated with greater uncertainties and risks,

even if the transaction were announced during a high sentiment period.

These results have complemented existing research on investor sentiments by extending the influence of cross-sectional sentiment from its original setting within asset pricing (e.g., Shiller, 1981; Fama and French, 1988; Brown and Cliff, 2005) to the context of mergers and acquisitions. Specifically, aggregate and cross-sectional investor sentiments have a certain bearing on targets' announcement returns and takeover premium. In addition to providing some original insight to existing literature, in relation to investor sentiment and takeovers, this chapter also sheds light on the issue of investor sentiment by bringing new techniques to this research area. Following Baker and Wurgler (2006), a relatively comprehensive investor sentiment indicator, rather than other noisy sentiment proxies, has been constructed for the UK market for the 1987 to 2007 period.<sup>92</sup> This newly developed UK sentiment index forms a basis for future research on UK investor sentiment.

Findings from chapter 4 have revealed that investor sentiment, as a factor associated to misvaluation, can explain gains from corporate takeover to some extent. This suggests that other factors, related to misvaluation, may have some influence on mergers and acquisitions. Information asymmetry surrounding a firm can increase the possibility of misvaluing this firm. Therefore, the relationship between information asymmetry and takeovers is also worth considering. The focus on information asymmetry surrounding acquirers fits into the overarching research area of this thesis (i.e. information environment). It also has the potential to further this research area.

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<sup>92</sup> The Baker and Wurgler (2006) sentiment index has been extensively used by financial economists since it was developed (Derrien and Kecskes, 2007; Zhu *et al.*, 2008; Mian and Sankaraguruswamy, 2008), as it extracts the common variation of suggested sentiment proxies and lines up perfectly with anecdotal evidence in the US stock market. However, up until now, no such sentiment index had been available for the UK market.

More specifically, the information environment addressed in the first two empirical chapters is a static one. Once the relationship between information environment and corporate takeovers is extended from a one-side-connection (i.e. information environment influences on the value effects of takeovers) to an interaction that, during takeovers, allows for a change in information environment surrounding the firms involved, these environment changes may also bear some impact on the value effects of takeovers. Chapter 5 has examined this conjecture.

The results in Chapter 5 have indicated that changes in information asymmetry influence frequent bidders' gains via revaluation. The scale of revaluation is likely to be determined by the information environment of the firm concerned. Less-covered companies who are subjected to severe information asymmetry are given more value corrections around their takeover announcements. Since takeover announcements continually disseminate new information to the market, information asymmetry surrounding an acquiring firm decreases after the firm's takeover announcement. This asymmetry further decreases with subsequent bids announced by this acquirer. Therefore, in a merger series, the scale of investor revaluation should constantly decrease because of the declining information asymmetry with subsequent bids. Consequently, serial non-equity financed cash deals should generally be associated with declining announcement returns, as their positive revaluation constantly decreases with subsequent takeover announcements.<sup>93</sup> However, serial equity financed cash deals and share deals do not generate diminishing bidder's gains with subsequent bids, because their negative revaluation constantly decreases with

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<sup>93</sup> In addition to the scale of revaluation determined by the information asymmetry surrounding a firm, the direction of this revaluation depends on the information content. Investors regard otherwise-financed cash deals (equity financed cash deals or share deals) as positive (negative) signals and assign more (less) value to the acquiring firms. Therefore, with regard to serial non-equity financed cash deals, their positive revaluation constantly decreases with subsequent takeover announcements

succeeding takeover announcements.

A decline in bidders' announcement period returns with subsequent mergers has been widely documented (e.g., Schipper and Thompson, 1983; Loderer and Martin, 1990). The empirical findings in chapter 5 have indicated that such declining returns are not generalizable. Once frequent bidders are partitioned by their payment financing methods, the patterns of their short-run gains along their acquisition series can be characterized differently. This inconsistency with existing literature is attributable to the different signalling implications of payment financing methods in the presence of information asymmetry. These signalling implications are one of the primary factors underlying the stock performances of frequent bidders. Specifically, they drive frequent bidders' gains in the same direction as the nature of information signalled by respective payment financing methods.

These findings have clarified the fundamental difference between 'methods of payment' and 'transaction financing sources', which are assumed to be the same in the majority of previous literature. These findings have also furthered the theoretical implications of the information asymmetry hypothesis on corporate takeovers by introducing a relation between takeovers and dynamic information asymmetry. This relation is beyond the current setting of takeovers and static information asymmetry.

## **6.2 Implications of Findings**

The empirical results on the value effects of both static and dynamic information environment, and the suggested mechanisms under which these value effects work, make an important contribution to the knowledge of wealth creation through corporate

takeovers. Further, this carries significant implications for corporations, investors and researchers who are involved in the takeover market. These three groups of implications are outlined below.

The findings of this thesis, especially those on the relevance of information contents and information asymmetry to the value effects of takeovers, can facilitate companies, engaged in mergers and acquisitions, to balance their information and investment efficiency. The findings also facilitate a coordinating of their financing and investment decisions. These two implications are outlined below.

Firstly, information asymmetry surrounding bidding and target firms, in particular frequent acquiring firms, is ever changing, as the firms' takeover announcements constantly disseminate firm information to the market. Given this, as well as the trade-off between information efficiency and investment efficiency (Singh and Yerramilli, 2009), purely seeking positive revaluation effects at takeover announcements generates more destructive investment outcomes for extremely acquisitive bidders than to casual bidders. Instead, acquisitive bidders should focus more on investment projects that generate long-run value.

Secondly, a hybrid of a transaction's payment method and its financing source influence both casual and frequent bidders' gains. Since mergers and acquisitions are among some of the main investment decisions made by corporate organizations, the documented relevance of payment financing methods to takeovers' value effects highlights the interdependence of investment and financing decisions. Such interdependence suggests that wealth creation not only depends on the pattern of resource allocation but also relies on the financing of the resource allocation.

Therefore, in order to enhance a firm's value, the need for a closer integration between strategic planning and the financial function of raising funds is required. From the perspective of cash bidders, given the negative market responses that follow equity financed cash deals, funds from other sources, for example debt or cash, are presented as better transaction financing choices so long as they have sufficient cash reserve or debt capability.

In addition to the contributions made to corporate organizations engaged in the takeover market, this thesis identifies some areas which investors can improve upon to maximize their interests. The findings of this thesis, especially those concerning the relevance of market condition and information asymmetry to value effects, provide investors with an additional guide for investing in stocks of firms engaged in mergers and acquisitions. Specifically, the empirical evidence in this research has shown that, i) acquisitions announced during a low market or industry period and, ii) acquisitions announced by overvalued bidders who make non-equity financed cash deals and, iii) acquisitions announced by acquisitive bidders who make non-equity financed cash deals, all generally underperform relative to their counterparts<sup>94</sup>. Therefore, if investors aim to capture benefits in the short-run, they should avoid investing in these types of acquiring firms.

Financial researchers, examining the takeover market, form the third group of beneficiaries of the thesis. In particular, this research develops their awareness of information environment in theorizing the activities and the value effects of corporate takeovers. Furthermore, the empirical findings of this thesis, together with the related

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<sup>94</sup> The counterparts refer to i) acquisitions announced during a high market or industry period and, ii) acquisitions announced by undervalued bidders who make non-equity financed cash deals and, iii) acquisitions announced by acquisitive bidders who make equity financed cash deals.

theoretical implications, contribute to the ongoing debate on the rationale underlying the value effects of mergers and acquisitions.

Much literature has drawn theoretical implications from traditional theories, including managerialism theory (Berkovitch and Narayanan, 1993 and Jensen, 1986), efficiency theory based indigestion hypothesis (Conn *et al.*, 2004), neoclassical economics based capitalization and diminishing returns hypothesis (Ismail, 2008). Accordingly, determinants of the value effects of takeovers have been predicted by these hypotheses, yet none of them can provide a consistent and comprehensive explanation to this issue given the following three considerations.

Firstly, a significant positive relation between market valuation and bidders' gains around takeover announcement periods has been presented in Chapter 3. These can be explained by managerial herding (Bouwman, 2006).<sup>95</sup> However, this theory fails to rationalize merger performance when misvaluation is at a firm-specific level. In particular, managerial herding cannot explain the outperformance of undervalued bidders, relative to their overvalued counterparts.

Secondly, investor sentiment exerts an influence on premium determination (Chapter 4), which suggests that the decision to merge is not flooded with private managerial gains as suggested by managerialism theory (Berkovitch and Narayanan, 1993; Seyhun, 1990)<sup>96</sup>. Rather, managers of acquiring firms rationally evaluate the

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<sup>95</sup> 'Managerial herding' suggests that if a large number of firms get involved in mergers and acquisitions, subsequent firms will follow the trend ignoring their own motives and not fully considering the valuation of this investment decision. Therefore, the underperformance of high-market acquisitions is primarily driven by the low stock returns to firms acquiring later in a high-market merger wave.

<sup>96</sup> The managerialism theory indicates that managers consciously seek personal interest-maximization at the cost of their shareholders. In determining the offering price paid to a target firm, the pure economic gains for acquiring firms are not the sole motivation, or even the primary motivation, of



investment and forecast future operations. It then follows, it is less likely that managers knowingly overpay in acquiring targets.

Thirdly, the reported sequential bidder's gains in Chapter 5 are inconsistent with the predictions of capitalization hypothesis<sup>97</sup>, as announcement period returns of the 4<sup>th</sup> bids remain positive. Although the documented declining returns in an acquisition series are potential theoretical implications of diminishing returns hypothesis or indigestion hypothesis (Conn *et al.*, 2004)<sup>98</sup>, both fail to explain why this declining pattern does not exist in equity financed offers or share deals.

The comparisons between the empirical findings of this thesis against the theoretical predictions of several theories and hypotheses indicate that these theories and hypotheses are inadequate in rationalizing the documented performance of UK takeover activities. Rather, as discussed in the previous sub-section, a relatively thorough understanding regarding this issue can be provided by information environment related explanations. The information-related factors, including information contents (information signalled by takeover announcements), information sender (information asymmetry surrounding acquiring firms and information uncertainty regarding target firms), information recipient (investor sentiment involved in interpreting the information) and market condition (misvaluation) can give a coherent description of bidding and target firms' gains in the UK takeover market.

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managers from bidding firms. Instead, driven by personal benefits, they seek to acquire firms and overpay their targets.

<sup>97</sup> "The capitalization hypothesis suggests that the market capitalizes the value of subsequent acquisitions when the first acquisition in a program is announced. The prediction is that no returns should be observed on later acquisitions in a program" (Ismail, 2008, p.73).

<sup>98</sup> For extensive discussion on diminishing returns hypothesis or indigestion hypothesis, see section 5.2.1.1. Both of these hypotheses predict that bidders' announcement period returns decline with subsequent mergers.

### 6.3 Limitations and Areas for Future Research

Effects of information content, in the presence of misvaluation, on the wealth creation of takeovers have been examined in chapter 3. This information content has been regarded as the signal sent out by a transaction's payment financing method, where cash payment and non-equity financing, in general, signal positive information to the market. This positive market reaction is based on the premise that acquirers are not using their inflated shares to acquire a target firm. However, according to the UK Takeover Code, cash payment can be mandatory or voluntary. Specifically, cash consideration is made mandatory in acquiring a public target if a bidder holds over 10% interests of the acquired firm over the offer period or 12 months prior to the announcement. In this case, the offer should be in cash or accompanied by a cash alternative at not less than the highest price paid by the bidder or any competitor during the offer period and within 12 months prior to the announcement.

For mandatory cash deals, acquiring firms have to make cash payment, although they may have the intention to use their overvalued shares. Therefore, information inherent in mandatory cash deals may not be as positive as those in voluntary cash deals. Accordingly, in understanding the value effects of information contents on takeovers, there is the necessity of differentiating the market reactions to these two different types of takeover deals. Nevertheless, as acknowledged before, out of the 6086 observations, there are 429 cash deals in acquiring public targets, of which 29 (92) bidders have less (more) than 10% interests of the targets before announcements and 308 with unavailable information. Due to the data availability, distinguishing legally- or spontaneously-made cash deals becomes infeasible. Therefore, it remains as a question as to how to separate voluntary cash deals from mandatory ones with

adequate information. The answer to this question could be used to further the understanding on the relationship between information contents and takeover gains.

Effects of investor sentiment, towards information released via takeover announcements, on the wealth creation of takeovers have been examined in chapter 4. Investor sentiment has been measured as the first principal component of four factors hypothesized to represent investor sentiment, namely, investment trust discount, FTSE turnover, the number of IPOs and consumer confidence index. Mergers and acquisitions deals have then been sorted into five groups according to the level of investment sentiment persistent during the announcement period. Although deals announced during the highest sentiment period, in general, generate higher gains to target firms than those announced during the lowest sentiment period, there is not a monotonic increase in target announcement returns with the increase in investor sentiment. The fluctuations in target firms' gains across the three neutral sentiment groups do not show a systematic pattern. Similarly, monotonic changes in takeover premium across the three neutral sentiment groups also cannot be seen. It remains a puzzle, how to explain this 'grey area'. Possible explanations may be given based on different investor sentiment, announcement returns or takeover premium measurements. Using abnormal returns based on CAPM or risk-adjusted model rather than market model, as well as takeover premium measured over a less than (or greater than) 4-week window, may reveal a monotonic trend in value as investor sentiment increases from the lowest level to the highest level.

The effects of changes in information asymmetry surrounding acquiring firms, conditional on information contents signalled by takeover announcements, on the wealth creation of serial takeovers have been examined in chapter 5. As was the case

with the methodology employed in chapter 3, this information content has been regarded as the signal sent out by a transaction's payment financing method, where non-equity financed cash payment, in general, signal positive information to the market. As acknowledged before, there is an inability to link a pound raised to a pound spent in takeovers. Given this, an approximate, rather than an actual, relation between a transaction and its financing source has been created by measuring transaction financing with pre-takeover equity issues or changes in the balance sheet. However, the proceeds from a firm's equity issue may not necessarily finance the firm's acquisition. The fund can be used for the firm's other investment decisions. Similarly, an increase in equity showing on a firm's balance sheet may not suggest an equity financing source for the firm's acquisitions. Therefore, it remains as an open question as to how to establish an accurate, rather than an approximate, one-to-one relationship between transaction payment and transaction financing. Research on the value effects of payment financing methods, and thus the understanding of the value effects of information contents, could be furthered with the answer to this question.

By examining the value effects of some information related factors, including market condition (misvaluation), information contents, sentiment showing by information recipients (investors sentiment) and information asymmetry surrounding information senders (acquirers), this thesis has rationalized the influence of information environment on the wealth creation of corporate takeovers. These factors, as well as their relationships to gains from mergers and acquisitions, have been assessed separately in the three empirical chapters. However, these elements are connected and inherent in the information dissemination process via takeover

announcements.<sup>99</sup> The interactions between them, together with the relevance of these interactions to takeover gains have not yet been discussed. This uncovered area proposes a direction for further research, where all the information related elements can be examined in one framework that allows for interaction between these elements.

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<sup>99</sup> In addition, the connections between these factors exist beyond the setting of information dissemination. More specifically, one of information elements examined is misvaluation; its relationship with mergers and acquisitions has been reported. Investor sentiment and information asymmetry, as another two information elements examined, are factors related to misvaluation, which can increase the possibility of misevaluating a firm.

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